MASTER'S THESIS

The realization of Natura 2000 goals: drivers of success and failure

The influence of the interplay of actors and sectors on nature management

Noppen, K.

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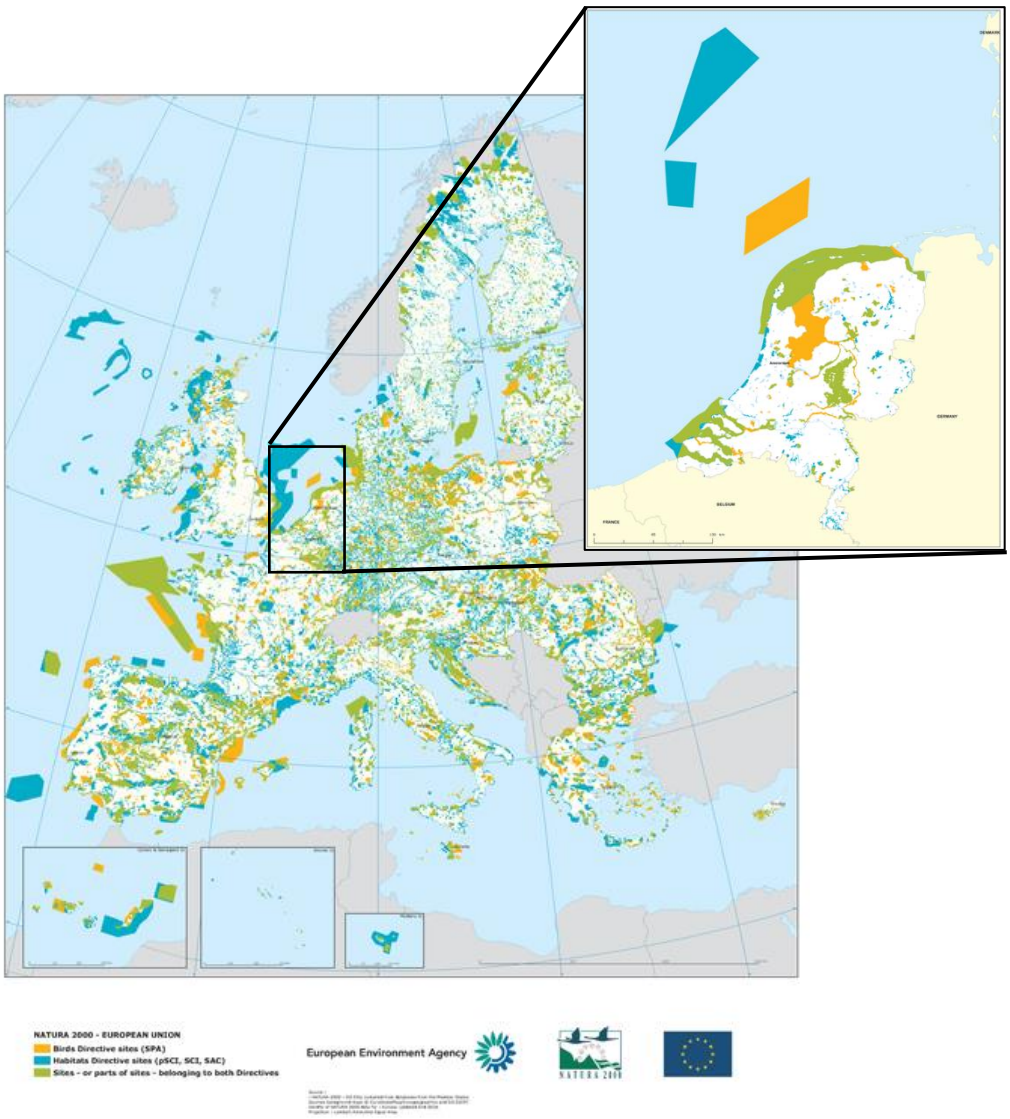

Krista van Noppen

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Thesis MSc Environmental Sciences (NM990A)

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The realization of Natura 2000 goals: drivers of success and failure

The influence of the interplay of actors and sectors on nature management

Het bereiken van de Natura 2000 instandhoudingsdoelen: succes- en faalfactoren

De invloed van de wisselwerking tussen actoren en sectoren op natuurbeheer

Thesis MSc Environmental Sciences
Krista van Noppen, July 2021

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Preface

Before you lies the thesis titled “The realization of Natura 2000 goals: drivers of success and failure. The influence of the interplay of actors and sectors on nature management”. This qualitative research on the borderline between social and natural sciences has been undertaken to fulfill the graduation requirements of the Master of Science program of the Environmental Sciences department at the Open University in the Netherlands. The research took place between January 2020 and July 2021.

The road that led up to this point has been rocky but inspiring. I started the premaster in 2016, and at that time my main drive was to better understand the way the world works. It has been fun, it has been frustrating and it has been saddening. To my personal opinion, studying environmental sciences is not for the faint hearted.

During my study I changed jobs, I changed houses and I changed my marital status. Oh, and of course: Corona happened. Up until a few months ago, I wasn’t sure whether I would make it to the finish line. But here it is.

I have to thank many people who helped me, inspired me, and cheered me up along the way. Sjaak Grever, my ex-boyfriend but still my best friend. Always ready to cook a delicious meal (maybe you should do something with it?) and help me blow off steam when I got stuck in the process. My fellow students Erik Roest and Frida Miedema. A problem shared is a problem halved. Thank you for the many chats and encouraging words. I want to thank the friends that remained, even though I often had to pass on appointments. You know who you are. I have spent more time in my new attic than I have in the rest of the house, and by my side has always been my buddy Pebbles. She spent many hours sleeping on the bed, every now and again opening an eye just to check if I was still there, patiently waiting until I would take her out for a walk. We have gotten old and grey together.

I want to give special thanks to my thesis supervisor Raoul Beunen. The meetings we had always gave me confidence that I was on the right track and your profound knowledge of the subject challenged me to dig deeper.

Krista van Noppen

Heeswijk-Dinther, July 2021

Abstract

Humanity depends on healthy and biodiverse nature. Economic growth and prosperity have caused various environmental problems, including the loss of biodiversity. In response to this, nature conservation policy has been developed at various levels, from global to regional. In the European Union, the legal cornerstone of nature conservation policy is formed by the Birds and Habitats Directive and the associated Natura 2000 conservation objectives to be achieved in the Natura 2000 areas. Member States are free to determine how they wish to manage the areas. Management plans are often used for this.

The implementation of nature conservation policy and the realization of policy goals has proven difficult. Habitats and species in the Natura 2000 areas are still a long way from being in a good conservation status. This is caused by vertical and horizontal coordination problems due to the increased number of actors and sectors in the policy arena. The interests of actors and policy goals of adjacent policy may conflict. To tackle these problems, an integrated approach is often proposed, in which stakeholder participation and policy integration of adjacent policy fields play an important role.

This study investigated how the interplay of actors and sectors influences the realization of the Natura 2000 conservation goals, by analyzing the underlying factors that influence the integrated approach to developing and implementing Natura 2000 management plans in North Brabant. This was done by a literature study to get more insight into the development of nature conservation policy and the implementation problems on international and national level, a desk study to get insight into the results this has led to in terms of halting the loss of biodiversity and the state of nature on EU level and in the Netherlands, and a case study to get insight into the development and implementation of Natura 2000 policy on a regional level.

The results indicate that participation and policy integration do indeed play an important role. With a well-executed integrated approach, the right stakeholders are involved in a timely manner, the right tools and methods are used, there is clarity about the division of roles, there is a shared responsibility and sense of urgency, there is cooperation between the stakeholders, there is mutual trust and respect and basic principles are not up for discussion. There is also a clear legal framework, coherence between sectoral policies, and alignment on policy implications and management processes.

What this research has also shown is that it is crucial that there is political commitment and ambition. In the Netherlands, political standpoints and policy choices fail to address root causes of the problems for nature policy goals. At the political level the choice was made not to pursue the agreements that were made on an international level, and to only fulfill the minimal requirements. As a result, the gap between the nature objectives to be achieved and the current state of nature will only widen and nature conservation will ultimately only become more difficult and more expensive. The findings of this study show that an integrated approach is required to improve the realization of nature policy goals, but depends on political commitment and ambition. It has also become apparent that it is not only sufficient to have enough financial resources, but also to ensure that the budget can be used where needed.

Samenvatting

Voor haar welzijn is de mensheid afhankelijk van gezonde en biodiverse natuur. Economische groei en welvaart hebben diverse milieuproblemen veroorzaakt, waaronder biodiversitietsverlies. Als reactie hierop is op diverse niveaus natuurbeleid ontwikkeld, van mondiaal tot regionaal. In de Europese Unie wordt het belangrijkste natuurbeleid gevormd door de Vogel en Habitat Richtlijn en de bijbehorende Natura 2000 instandhoudingsdoelen die bereikt moeten worden in de Natura 2000 gebieden. Lidstaten zijn vrij om te bepalen hoe zij de gebieden willen beheren. Vaak worden hiervoor beheerplannen gebruikt.

De implementatie van het beleid en het behalen van de doelen verloopt moeizaam. Habitats en soorten in de Natura 2000 gebieden zijn nog ver verwijderd van een volledige goede staat van instandhouding. Oorzaken hiervoor zijn te herleiden tot verticale en horizontale coördinatieproblemen vanwege het toegenomen aantal actoren en sectoren in de gehele beleidsarena. Belangen van actoren en beleidsdoelen van aanpalend beleid kunnen daarbij conflicteren. Om deze problemen te verhelpen wordt vaak een integrale aanpak voorgesteld, waarbij participatie van belanghebbenden en beleidsintegratie van aanpalende beleidsvelden een belangrijke rol spelen.

Deze studie heeft onderzocht hoe de wisselwerking tussen de actoren en sectoren invloed heeft op het behalen van de Natura 2000 instandhoudingsdoelen, door de onderliggende factoren te analyseren die invloed hebben op de integrale aanpak met betrekking tot het ontwikkelen en implementeren van Natura 2000 beheerplannen. Dit is gedaan d.m.v. een literatuurstudie om meer inzicht te krijgen in de ontwikkeling van natuurbeleid en de uitvoeringsproblematiek op internationaal en nationaal niveau, een deskstudie om inzicht te krijgen in de resultaten die dit heeft opgeleverd in termen van het stoppen van het verlies aan biodiversiteit en de toestand van de natuur op EU-niveau en in Nederland, en een case study om inzicht te krijgen in de ontwikkeling en uitvoering van Natura 2000-beleid op regionaal niveau.

De resultaten wijzen uit dat participatie en beleidsintegratie inderdaad een belangrijke rol spelen. Bij een goed uitgevoerde integrale aanpak worden de juiste belanghebbenden tijdig betrokken, worden de juiste methodes gebuikt, is er duidelijkheid over de rolverdeling, is er sprake van een gezamenlijk belang, is er samenwerking tussen de belanghebbenden, is er onderling vertrouwen en respect en staan uitgangspunten niet ter discussie. Ook is er sprake van een duidelijk wettelijk kader, samenhang tussen de beleidsvelden en duidelijkheid over de wederzijdse gevolgen van de beleidsvelden.

Wat ook uit dit onderzoek blijkt, is dat het cruciaal is dat er politiek commitment en ambitie is. In Nederland slagen politieke standpunten en beleidskeuzes er niet in de grondoorzaken van de problemen voor natuurbeleidsdoelen aan te pakken. Op politiek niveau is ervoor gekozen om de afspraken die op internationaal niveau zijn gemaakt niet na te streven en alleen aan de minimale eisen te voldoen. Hierdoor zal de kloof tussen de te behalen natuurdoelen en de huidige natuurtoestand alleen maar groter worden en wordt natuurbehoud uiteindelijk alleen maar moeilijker en duurder. De bevindingen van dit onderzoek laten zien dat een integrale aanpak nodig is om de realisatie van natuurbeleidsdoelen te verbeteren, maar afhankelijk is van politiek commitment en ambitie. Ook is gebleken dat het niet alleen voldoende is om over voldoende financiële middelen te beschikken, maar ook om ervoor te zorgen dat het budget daar waar nodig kan worden ingezet.

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1. Introduction

Nature and biodiversity form the building blocks for human life on earth. Healthy ecosystems deliver services like food, energy, and raw material for our economy, or protect us from the harmful consequences of climate change or an outbreak of disease (European Commission, 2019). Exponential growth of the world population, rapid increase in consumption and technological innovation have resulted in, amongst others, the largescale loss of biodiversity, and has put pressure on the state of nature in regards to its ability to deliver these ecosystem services (IPBES, 2019a). Despite various nature policy measures and agreements that have been taken over the last decades, up to 1 million out of 8 million species on earth are threatened with extinction, in many cases possibly within a few decades, and rates of biodiversity loss are projected to continue or accelerate in the future (Millennium Ecosystem Assessment, 2005b; IPBES, 2019a, 2019b; Sanders, 2019).

Halting the loss of biodiversity by 2020 has been the overall goal of the biodiversity agreements and nature conservation policy measures (CBD, n.d.; EEA, 2019d). The main international agreement to protect biodiversity on a world scale is the Convention on Biodiversity (CBD), which entered into force in 1993, and was signed by 196 parties (CBD, n.d.). Following the commitments within the international CBD, the European Commission (EC) decided to form a coordinated network of protected nature areas throughout the European Union (EU), and the EU developed an EU-wide Biodiversity Strategy, aiming to halt the loss of biodiversity in the EU and help stop global biodiversity loss by 2020 (EEA, 2019d). The EC's decision to create a cohesive network of protected nature reserves was taken after the treaty was concluded, but it is based on the 1979 Birds Directive and the 1992 Habitats Directive. The foundation for the network was therefore laid before the conclusion of the treaty. The idea of a Natura 2000 network of protected European areas had already arisen in response to the increasing loss of biodiversity in the EU in the second half of the 20th century (Van der Straaten, Van Kruijsbergen, & Sierdsema, 2020).

The Birds and Habitats Directives (BHD) and its Natura 2000 network form the legal cornerstone for the protection of biodiversity in the EU. The Natura 2000 network is one of the largest coordinated networks of protected nature in the world. The Birds Directive was adopted in 1979 after it became known that a large number of migratory birds did not survive the migration south due to hunting. It aims to conserve Europe's wild bird species and their habitats in a good state of conservation, based on ecological, scientific and cultural requirements, while taking into account economic and recreational purposes. The Habitats Directive passed in 1992 and has similar goals as the Birds Directive. It aims to protect more than 1200 rare, endangered plant and animal species, and over 230 rare habitat types. The objectives of this directive are the conservation of biodiversity and to guarantee a favourable conservation status of the plants, animals and their habitats that are included in the directive, taking into account economic, social and cultural requirements (van der Zouwen & van Tatenhove, 2002; European Commission, 2016; Bastmeijer & Trouwborst, 2015).

The BHD form a legal obligation for all Member States to assign protected nature areas, called Natura 2000 areas. These directives organize the legal protection of Europe's natural heritage at Community and transboundary level against further degradation (Van der Zouwen & Van Tatenhove, 2002; European Commission, 2016). They include the obligation to translate the broader conservation goals as described in the directives into area specific goals for habitats and species and activities (measures) that are necessary to achieve the goals. Measures for the realization of the conservation goals have to be balanced with socio-economic interests (Bastmeijer & Trouwborst, 2015). Plans or projects that can have a significant negative effect on a Natura 2000 area must be assessed, and all compensatory measures necessary to ensure the coherence of the network must be taken (EEA, 2015).

Despite the mandatory character and clear structure, the EC concluded in a 2016 mid-term policy evaluating “fitness check” that the goals had not yet been achieved, and that it was not possible to

predict when that would be the case (European Commission, 2016). In 2020 the percentage of EU-wide habitats and species in a good state of conservation remain low: only 15% of habitats, 27% of species, and 47% of bird populations are in a good state of conservation, and trends are negative (Naumann et al., 2020).

1.1 Problem definition

Problems regarding the realization of BHD policy goals fit into a bigger picture of governance challenges in regards to the development and implementation of European policies. It can be traced back to the early establishment of the EU, where the initial focus was on restoring a war-torn Europe. The main aim was to establish a common market (for goods, services, people, and capital) and economic growth (Jordan, Benson, & Rayner, 2012). Major policy changes, such as in the areas of transport and agriculture, fueled rapid economic growth in Member States. The downside was that this was accompanied with persistent and often transboundary environmental problems, such as the severe decline in biodiversity (Spangenberg, 2012).

To tackle these problems sectoral policies were developed with a long-term focus on economic and social growth, for example in the field of agriculture and waste, and also for the conservation of biodiversity (Jordan et al., 2012). However, it has proven difficult to implement environmental policies and realize the full extent of their objectives. The conventional sectoral organization of governance institutions seems to undermine the successful design and implementation of integrated policy responses. The sectoral organization creates a barrier in cross-scale transmission of knowledge and collaboration. Synergies between sectoral objectives are assumed but often lacking (De Kraker, 2008). Measures on behalf of policy goals from one sector can create or enlarge problems for the realization of policy goals from another sector. This is particularly the case if measures have financial consequences or existing political interests are jeopardized (Beunen, Van der Knaap, & Biesbroek, 2009; Ledoux, Crooks, Jordan, & Turner, 2000; Mermet, Billé, & Leroy, 2010; Tosun & Lang, 2017).

National governments have to balance between requirements on EU-level, transpose these to regional and local authorities, and include non-state actors that have gained more and more influence on policy processes. This has led to vertical and horizontal governance problems: problems in coordination between actors at different levels (vertical), and coordination between various policy sectors (horizontal). The tasks and responsibilities of the national governments have changed and in order to improve the realization of policy goals, there is a greater emphasis on cooperation between and outside of governmental institutions: in addition to the responsibility to implement policy, governments are now also responsible for organizing structures and processes to engage all relevant stakeholders (Sterling et al., 2017; Beunen & De Vries, 2011). Actors with conflicting interests often use this process to promote their own interests, and discuss how the guidelines should be interpreted and applied (Beunen et al., 2009). Often, the formal and informal rules that determine how collective decisions are made have a large influence on the realization of policy goals (Beunen et al., 2009).

These vertical and horizontal governance problems also play a role in the development and implementation of nature policies. Studies on the effectiveness of nature policies have indicated that problems towards the realization of biodiversity goals do not lie in the adequacy of the policy responses as such. Biodiversity conservation is also, to some extent, integrated into EU legislation as a whole, for example in agri-environmental measures (Spangenberg, 2012). However, a large biodiversity research project (ALARM, 2004 – 2009) identified that the actual integration of policy objectives is still a challenge, and that many adjacent policy sectors are causing the main pressures at the EU level. Most commonly mentioned as a source of conflicting objectives are agriculture, chemicals, and transport (Spangenberg, 2012; Ledoux et al., 2000; Jordan et al., 2012).

In regards to the realization of the Natura 2000 conservation goals, Jordan, Benson, & Rayner (2012) also found that further progress of the Natura 2000 network is hampered by the negative influence of many other EU policy fields and a lack of cross-sectoral policy. In order to reach the necessary improvements in the conservation status of habitats and species, completion and good management of the Natura 2000 network are essential (EEA, 2019a; EC, 2017).

Studies on the process have shown that an integrated approach that is based on participation and that facilitates policy integration is necessary for the realization of Natura 2000 conservation goals. Ideally, an integrated approach will lead to the vertical and horizontal integration of actors (government, society, and market) and policies, and contribute to the realization of these policy goals. (Blicharska, Orlikowska, Roberge, & Grodzinska-Jurcak, 2016; Sterling et al., 2017; Kovács et al, 2017; Gallo et al., 2018; Brescansin et al., 2016; Beunen & De Vries, 2011; Jones-Walters & Çil, 2011).

1.2 Research demarcation

Work to date on the development and implementation of Natura 2000 management has identified a number of factors that explain the success or failure of the realization of nature conservation policy objectives. Various studies (Sterling et al., 2017; Blicharska et al., 2016; Mattijssen, 2018; Kovács et al, 2017; Gallo et al., 2018; Brescansin et al., 2016), conclude that properly involving stakeholders in the entire process can influence whether biodiversity goals are achieved, or conflicts emerge (De Kraker, 2008; Jones-Walters & Çil, 2011).

Most studies, however mainly focused on specific cases and mainly analysed specific factors independently; either focusing on process related issues such as stakeholder engagement or policy integration, or the ecological results of policy measures. Less attention has been paid to the interplay between the components, how that interplay impacts the process, and the extent to which the policy objectives are achieved. This makes it difficult to draw general conclusions about how to improve the outcome and improve nature management (Sterling et al., 2017; Blicharska et al., 2016). From research to date, it was not possible to confirm that improving the process will indeed lead to improved environmental outcomes (Blicharska et al., 2016; Sterling et al., 2017).

1.3 Research objective and central question

The objective of this study is to examine the influence of the interplay of actors and sectors on the realization of Natura 2000 conservation goals. This is done by analyzing the underlying factors that influence the integrated approach in regards to the development and implementation of Natura 2000 management plans.

This is scientifically interesting, because there is a particular need for more research on factors of success and failure in regards to the process (*'What are the underlying factors that influence an integrated approach?'*) and the extent to which it affects the outcome (*'How do these factors influence the realization of Natura 2000 conservation goals?'*).

The research is socially relevant because Member States are struggling with the implementation of Natura 2000 policy and the obligation to achieve a good state of conservation for birds, habitats, and species. It would help if the Member States got a better grip on the factors that can contribute to achieving the goals.

One of the EU Member States that is struggling to achieve a good state of conservation for all BHD habitats and species is the Netherlands: only 12% of habitats, and 26% of species is in a good state of conservation (EEA, 2019a, 2019b). This study is conducted to contribute to the improved realization of Natura 2000 conservation goals in the Netherlands.

The central question is:
How does the interplay of factors underlying the integrated process for improved development and implementation of nature conservation policy influence the success or failure of the realization of the Natura 2000 conservation goals in the Netherlands?

1.4 Reading guide

This chapter provided an overview of the research topic. It described the problem in regards to biodiversity loss, nature conservation policy development, and implementation problems. It also described the research objective, why the research is relevant, and the central question that is studied during the research. Chapter 2 describes the research approach. It describes how the research was structured to align as closely with previous research as possible, and how the reproducibility of the research is ensured as much as possible. Furthermore it describes and substantiates the choices that are made within the research and the sub questions that are used to structure the research and study the central question. Chapter 3 describes the development of international nature conservation policy, the implementation problems and the results this has led up to so far in the EU. Chapter 4 describes the development of nature conservation policy and the implementation problems in the Netherlands, and the results this has led up to so far. It also provides insight into how Natura 2000 areas in the Netherlands are managed by analyzing the linkage between the state of nature in the Natura 2000 areas, the pressures on Natura 2000 areas, and the measures that are applied to improve the state and reach the conservation goals. Chapter 5 describes how Natura 2000 is managed in the province North Brabant, the Netherlands, and provides details about the regional linkage between state of nature, pressures and measures. Chapter 6 describes the underlying factors that have influenced the process and the content of the management plans. Chapter 7 describes how the results from the separate phases of the study can be integrated. Finally, conclusions, discussion and recommendations can be found in chapter 8 and 9.

2. Methodology

As described in Ch. 1, biodiversity loss is an environmental problem, caused by human activity. The problem has been addressed by forming nature conservation policy, setting nature conservation goals, and assigning a form of nature management to reach the goals. Despite many policy efforts, the goals are not met. Existing literature shows that policy integration and stakeholder engagement are important issues, but that more insights are needed in the factors of success and failure in regards to the process and the extent to which this process affects the environmental outcome. These are therefore important concepts in the research design. Figure 1 demonstrates the conceptual model of the research.

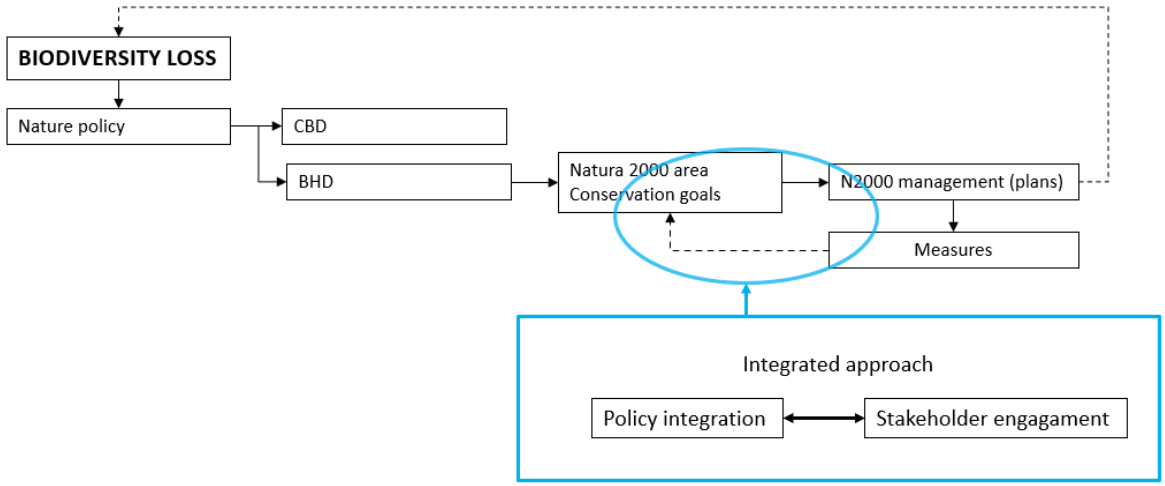

***Figure 1**: Conceptual model of the research (blue shapes show the area of focus of the research)*

The figure shows how the problem of biodiversity loss was followed up by the development of nature policy, for example the CBD and the BHD. The BHD led to the obligation for Member States to assign Natura 2000 areas, and set Natura 2000 conservation goals. In order to achieve these goals Member States can use management plans as a tool to reach the conservation goals. These management plans give insight into the ecological characteristics and state of the area, the goals to be reached and the measures needed to achieve the goals. An integrated approach is suggested to improve the linkage between nature management (through management plans and measures) and the realization of the conservation goals. However, policy integration and stakeholder engagement interfere with the process of development and implementation of the management plans. This research focuses on how this interference comes about, what it looks like, what its consequences are, and how this can be improved.

2.1 Research approach

Earlier studies were mainly performed as qualitative mixed-method research. The studies combined explorative literature studies about factors of success and failure for achieving nature policy goals with in-depth analyses through case studies that broadened and deepened theoretical aspects like levels, quality, and degrees of stakeholder engagement, and the level of success within the context in which it was applied. In general the methods that were used are desk and literature studies, interviews, surveys and an investigation of documentation and other archival records. In order to align as closely as possible with previous research about the effectiveness of policy integration and the influence of stakeholder engagement on the realization of nature policy goals, a comparable design was chosen.

2.2 Sub-questions

To analyze how the interplay of actors and sectors influences the integrated approach in regards to the development and implementation of Natura 2000 management plans, and to answer the central question "**How does the interplay of factors underlying the integrated process for improved development and implementation of nature conservation policy influence the success or failure of the realization of the Natura 2000 conservation goals in the Netherlands?**" the information from the literature study, desk study, case study and interviews was structured along several sub-questions:

1. How has nature conservation policy developed?
2. What problems are encountered in the development and implementation of nature conservation policy?
3. What results has nature conservation policy led to?
    a. What is the state of nature?
    b. Wat are the problems for nature?
    c. How are these problems addressed?
    d. What is the relationship between the responses and the problems?
4. What factors have interfered with the management of Natura 2000 sites in North Brabant?
5. How have these factors influenced the development and implementation of Natura 2000 management plans in North Brabant?

Figure 3 shows the flowchart of the research approach.

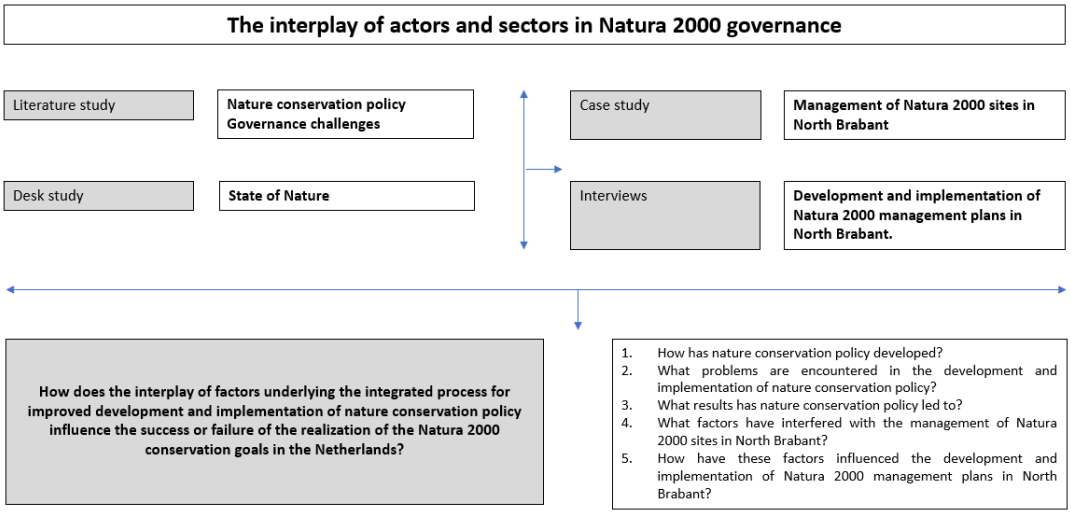

***Figure 3**: Flowchart of research approach*

To get insight into the underlying factors that influence an integrated approach and the extent to which these factors influence the realization of Natura 2000 conservation goals, this study was based on a few components: a literature study of scientific articles about the development of nature conservation policy and governance challenges, a desk study of reports and databases about the results achieved by nature conservation policy, and a case study of specific Natura 2000 areas in North Brabant, the Netherlands, studying several management plans and interviewing several people who were involved in the development and implementation of these management plans.

Literature study

Information about the development of nature conservation policy (global, EU, the Netherlands), and information about governance challenges in regards to the development and implementation of policy in general and nature conservation policy in specific was found through literature study. The literature study was performed by searching for and analysing scientific articles about participation,

biodiversity/nature conservation participation, stakeholder participation/engagement, policy integration, environmental policy integration, nature/Natura 2000 governance, biodiversity governance, implementation of nature/Natura 2000 policy, integrated approach, integrated approach for biodiversity/nature conservation, nature/Natura 2000 management, implementation of Birds and Habitats Directive/nature policy/Natura 2000, and derivatives thereof.

The goal of the literature study was to get insight into the development of nature conservation policy and the problems in regards to development and implementation on international and national level. This was done as a part of this research in order to be able to define the broad frameworks of the research more clearly.

Desk study

To get an impression of the results that have been achieved by nature conservation policy so far, data was searched about the state of nature in the EU. This information was studied by analysing the data in the 2007-2012 and 2013-2018 EU State of Nature reports about the conservation state of birds, habitats, and species in Natura 2000 areas in the EU. Member States deliver the input for the State of Nature Reports through national summary dashboards. The Dutch national summary dashboard was consulted for data about the conservation state of birds, habitats, and species in Natura 2000 areas in the Netherlands. The reports and summary dashboard were found through search engines by using the term “state of nature in the EU”.

The data also provided insight into the cause-effect-response relationship, because the reports and summary dashboard also contain data about pressures on the Natura 2000 areas and measures that are taken to address these pressures and/or reach the conservation goals. This data was also used for the analysis of the state of nature and the effectiveness of the Natura 2000 policy.

The goal of the desk study was to get insight into the effectiveness of nature conservation policy to date in terms of halting the loss of biodiversity and the state of nature on EU level and in the Netherlands. This was done as a part of this research in order to determine the gap between the intended result and the achieved results of nature conservation policy.

Case study

To get insight into the effect of the interplay of factors on the realization of Natura 2000 conservation goals in practice, the information from the literature study and desk study was held against case specific information. The case study was aimed at the management of Natura 2000 sites in North Brabant. The province North Brabant is chosen because it is representative for the area of study: it has over 20 Natura 2000 areas with a large variety in habitats and species, management plans have been systematically developed and implemented using an integrated approach, there are many different forms of land use with conflicting interests and sectoral policies, and the level of realization of the conservation goals varies throughout the province.

During this case study, six Natura 2000 areas were selected spread out over the province (fig. 2). The corresponding management plans were studied. The management plans were found in online databases. The content of the management plans was analysed with the aim to establish and analyse the local conservation goals, state of nature, pressures, and measures, and their relationship to each other. This was compared to the information about state, pressures, and measures that was found on a national level.

A summary was written in Microsoft Word (Appendix A), and a database was made containing information about the conservation goals, the state of birds, habitats, and species, pressures, and measures.

***Figure 2**: Natura 2000 areas in North Brabant (Noord-Brabant, 2017a)*
In red circles the areas that are analyzed within the research.

To identify the factors that influenced the process of development and implementation of the management plans in North Brabant, the content of the management plans, or the realization of conservation goals through the management plans, interviews were conducted with eleven people who were involved in the development and implementation of the Natura 2000 management plans in North Brabant. Table 1 provides an overview of the people that were interviewed. The interviews were performed online and recorded (MS Teams). The recordings were transcribed (Appendix B).

***Table 1**: Interviewees for the research*

Organization	Role	No. of people
Province North Brabant	Project manager Natura 2000 Strategical advisor area development	1 1
Water board De Dommel	Policy advisor biodiversity Project manager Natura 2000 Ecologist Spatial planning advisor	1 1 1 2
ZLTO (farmers interest group for the southern part of the Netherlands)	Policy advisor	1
Natuurmonumenten (nature association)	Ecologist	1
Working group de Peel (nature activist group for Natura 2000 areas in the Peel area)	Nature activist	1
Engineering bureau Royal Haskoning DHV	Ecologist	1

The interviews were conducted along the lines of the following themes:

- Process
    - How were stakeholders found / approached / involved?
    - Was the group of stakeholders complete?

- Pressures
    - What role did current land use activities play in the development and implementation of the management plans, and the pressures that are described in the management plans? How was this handled?
- Measures
    - How do the pressures relate to the measures that are included in the management plans?
    - Would the measures that are included be enough to achieve the conservation goals?
    - Are the measures implemented?
- Governance (stakeholder participation / policy integration)
    - Which methods were used to involve everyone at the right time and in the right way?
    - Did the available budget play a role?
    - Did other factors play a role (i.e. personal interests or skills)?
    - Was there resistance towards the process?

To bring all the information together and to analyse the information, a DPSIR-scheme was used, demonstrating the cause-effect-response relationship, and providing insight into factors of failure and factors of success.

The goal of the case study was to get insight into the development and implementation of Natura 2000 policy on a regional level and compare the general information about the realization of Natura 2000 on an international and national level to the findings in practice on a regional level. This was done as a part of this research in order to elaborate and critically examine the findings from the literature and desk study.

3. Nature conservation policy

3.1 Nature

The terms 'biodiversity' and 'ecosystem' are central and broad concepts in nature policy, and in relation to the environmental problem of biodiversity loss (Spangenberg, 2012). Biodiversity, or biological diversity, contains all diversity of lifeforms and their mutual relationships on earth (Ministerie van Economische Zaken, 2014; Compendium voor de Leefomgeving, 2017a). Compared to the broader term 'nature', 'biodiversity' only contains biological aspects (Compendium voor de Leefomgeving, 2017a). According to the CBD, biodiversity can be defined as the 'variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems' (Spangenberg, 2012; Compendium voor de Leefomgeving, 2017a). The network of biotic factors (living organisms) and abiotic factors (nonliving parts of the environment) together form an ecosystem (Helmenstine, 2020). Ecosystems are usually self-sustaining, but harmful changes can destabilize this ability. In general, larger ecosystems with a wide diversity are more stable (Nix, 2018). Human activities have caused fundamental, and to a significant extent irreversible, changes to the diversity of life on earth, mostly resulting in a loss of the original nature and biodiversity (WWF, 2018; Millennium Ecosystem Assessment, 2005b; Van Rhijn, 2007).

Biodiversity underlies all ecosystem processes and forms the building blocks for human life and human well-being on earth. Biodiverse ecosystems supply essential use and non-use services for our society and our economy, the so called ecosystem services, like food crops, pollination, clean water and climate regulation (Leemans, 2007; De Kraker, 2007 ; Compendium voor de Leefomgeving, 2017b, Millennium Ecosystem Assessment, 2005b). The natural beauty of nature also contributes to human health and well-being. Besides these (non-)use values, nature also has intrinsic value, a value of its own (Compendium voor de Leefomgeving, 2017a; European Commission, 2019; Leemans & De Kraker, 2007; De Kraker, 2007).

3.2 International nature conservation policy

Nature and mankind have an eventful relationship and nature has historically inspired both fear and appreciation. The way humans have looked at nature over time, is greatly affected by the experienced control humans have had over nature, and to what extent they felt connected to and/or responsible for nature (Bell, Greene, Fisher, & Baum, 2006; Zweers, 2000). Our attitudes towards the natural environment seem to reflect conflicts between positive and negative characteristics of nature. Historical European attitudes about nature and wilderness are negative, dominated by a fear and disgust of the untamed wilderness, fuelled by a "biblical prejudice that 'the garden of Eden' was the paradise from which humanity was ejected, and the desert wilderness was the land of hardship to which we were banished" (Bell et al., 2006). During the period of Enlightenment, European attitudes towards nature moderated, and at the end of the 19th century, humans started to understand that mankind is part of an intricate web of life, and that we depend on it for the supply of finite resources. An attitude of curiosity and conservation arose, albeit in the beginning the main reason for conservation was to preserve the availability of natural resources for human use (Bell et al., 2006).

We are now at the point where we have come to the realization that nature plays an important role in human well-being in a broad sense, and that it is our own activities that are causing a rapid decline in biodiversity. This motivated the international community to sign the Convention on Biological Diversity (CBD) at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992. The CBD is an agreement that is seen as a practical tool for the protection and use of biodiversity, seeking for sustainable use and equitable sharing of benefits (CBD, n.d.; Spangenberg, 2012). The overall goal is to halt biodiversity loss before the end of 2020 (CBD, n.d.).

The main international agreements on protecting biodiversity on a world scale as initiated through the CBD are captured in the Global Biodiversity Strategy (1993), the most recent version being the 'Strategic Plan for Biodiversity 2011-2020', which is specified by 20 targets (the 'Aichi Targets', and their generic and specific indicators). The CBD is preparing the 'Post-2020 Biodiversity Framework', which was to be adopted in 2020, and aims to be living in harmony with nature by 2050 (CBD, n.d.). Instruments for implementation at the national level are National Biodiversity Strategies and Action Plans (NBSAP), partnerships, and financial arrangements (CBD, n.d.; Compendium voor de Leefomgeving, 2017a).

There are other international agreements focussing on the protection of biodiversity. The best known ones are CITES (1975), restricting the trade in endangered species, the Ramsar Convention (1975), protecting wetlands, and the Bern Convention (1982), covering the protection of natural habitats and endangered species, including migratory species, in natural heritage in Europe as well as some African countries (Spangenberg, 2012; Kole, 2014; Bitzer, Cörvers, Glasbergen, & Niestroy, 2012).

3.3 EU nature conservation policy: Birds and Habitats Directives

Following the commitments within the international CBD, the EU has developed an EU-wide Biodiversity Strategy, focussing on six mutually supportive and inter-dependant targets which address the main drivers of biodiversity loss (European Union, 2011). The overall goal is to halt the loss of biodiversity and ecosystem services in the EU and help stop global biodiversity loss by 2020. The future vision for biodiversity in the EU is that "by 2050, EU biodiversity and the ecosystem services it provides are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human well-being and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided" (European Union, 2011; EEA, 2019d).

The legal cornerstone for the protection of biodiversity in the EU is formed by the Birds and Habitats Directives (BHD), dating from respectively 1979 and 1992. The Birds Directive aims to achieve a good conservation status of all wild bird species naturally occurring in the EU territory of the Member States (MS) (around 500 species), and is further developed and defined in the overall objective of the Habitats Directive, to maintain and restore around 230 natural and semi-natural habitat types and around 1.200 types of rare, threatened or endemic species of community interest to a favourable conservation status and ensure their long-term sustainability by 2020 (European Union, 2015; Tucker, et al., 2019; Compendium voor de Leefomgeving, 2017a; European Commission, 2019). *From here on, the term 'good conservation status' and derivatives are used to depict both the status of the habitats and species that fall under the Habitats Directive, and birds that fall under the Birds Directive.*

The main instrument to reach the good conservation status is the obligation for all Member States to assign Natura 2000 areas and organise their legal protection. This includes preventing any further deterioration of the habitats and species, and if necessary the introduction of positive conservation measures to improve their condition within the Natura 2000 areas (Compendium voor de Leefomgeving, 2017a, European Union, 2015). Exceptions are only possible if there are imperative reasons of overriding public interest, no alternatives are available, and measures are taken to eliminate the impact, so that a good state of conservation of the network is not endangered (Bastmeijer & Trouwborst, 2015; European Commission, 2016). The EC and the Court of Justice of the EU check both compliance with the implementation and the desired deviation (Bastmeijer & Trouwborst, 2015; EC, 2016; Van der Zouwen & Van Tatenhove, 2002).

Within six years of the designation of Natura 2000 areas, Member States need to adopt conservation measures. Many EU Member States are using management plans to ensure the sustainable conservation and management of Natura 2000 sites (Bouwma, Beunen, & Liefferink, 2018; Beunen & Kole, 2021). The decision about whether to use management plans lies with the Member States. Other

measures which correspond to the ecological requirements of the natural habitat types and the species of Community interest can also be used. The Directives make it clear that conservation objectives should be met while taking account of economic, social, cultural, regional and recreational requirements. It is up to the Member States themselves to establish the most appropriate methods and instruments for implementing the Directives and for achieving the conservation objectives of Natura 2000 areas. However, the EC strongly recommends the use of management plans (EEA, 2015; Bouwma et al., 2018; EC, n.d.).

Together, the Natura 2000 areas form the Natura 2000 network. Growing steadily since the mid 1990's, the Natura 2000 network is now one of the largest coordinated networks of protected nature in the world, connecting the most valuable and threatened species and habitats on land and at sea in the EU. It covers over 27.000 sites (designated areas) over an area of over 1 million km^2, almost 20% of Europe's land area and approx. 4% of the surrounding seas (fig. 4) (EEA, 2019a; European Union, 2015).

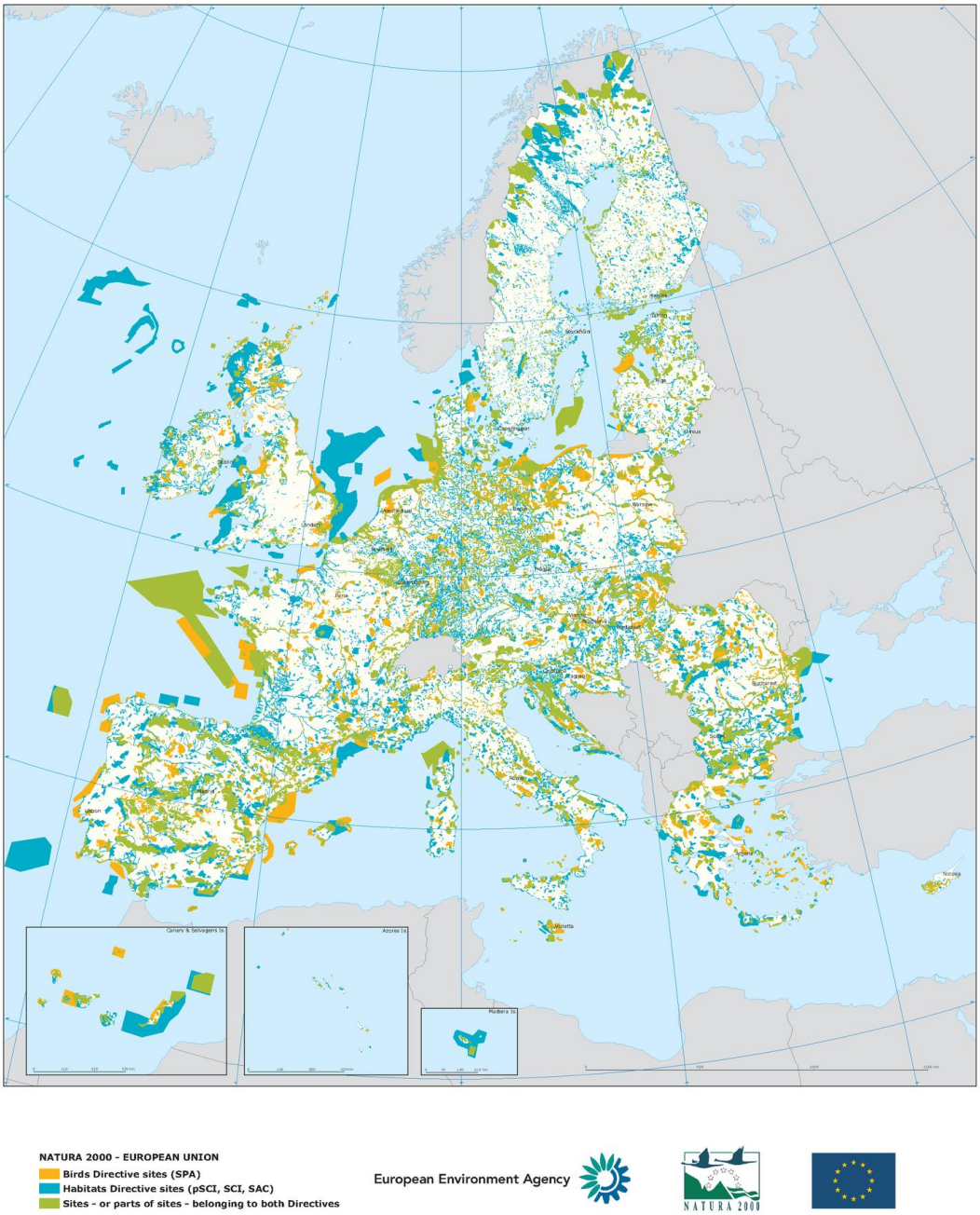

***Figure 4**: Natura 2000 areas in the EU (EEA, 2020a)*

Other EU-wide legislation connected to and/or aiming to support the protection of biodiversity are for instance agri-environmental measures, the Water Framework Directive and the Community legislation on chemicals and their safe use (REACH) (Spangenberg, 2012).

Besides ensuring a rich diversity of plants, animals and habitats in Europe, protecting the EU's natural heritage is also essential for our economy and our well-being, providing society with a diverse range of ecosystem services, and a source of income for those who harvest their natural resources (sustainably). The benefits that flow from the Natura 2000 network are estimated between €200 - €300 billion per year (European Union, 2015).

3.4 State of nature in the EU

In order to assess whether the required measures to prevent further deterioration, and improve the condition of birds, habitats, and species in the Natura 2000 areas have been taken and to evaluate their effect, Article 12 of the Birds Directive and Article 17 of the Habitats Directive call for Member States to regularly prepare and submit national reports on progress made in implementing the directives. The EC uses this data to create a six-yearly composite report (State of Nature report) (EEA, 2015).

Reports under Article 12 of the Birds Directive have been submitted since 1981. Reports under Article 17 of the Habitats Directive have been submitted since 2000. The first report (1994-2000) focused on the legal transposition and general implementation of the Directives. The second report (2001-2006) focused on the conservation status of the species and habitat types included in the Annexes to the Directives, as did the third (2007-2012) and fourth (2013-2018) report, which additionally focused on the effectiveness of measures that were taken (DG Environment, 2017a, 2017b; EEA, 2015).

Despite the assignment of Natura 2000 areas and organizing their legal protection, the goal to have all (100%) birds, habitats and species in the EU as listed in the BHD Annexes in a good state of conservation by 2020 has been missed. Less than half (47%) of all BHD bird species in the EU has a good population status, and almost 40% has a poor or bad status (Naumann et al., 2020). The trend is negative: bird species with a good conservation status have declined by 5% compared to the previous reporting period (2007-2012), and the percentage of species with a poor and bad status has increased by 7%. The state of BHD habitats and species in the EU is even worse: 75% of habitats are in a poor or bad state and only 15% has a good conservation status. Compared to the previous reporting period, bad conservation status for habitats has increased by 6% (Naumann et al., 2020). Of the species, over 60% are in a poor or bad state of conservation. 27% has a good conservation status, an increase of 4% from the previous reporting period (Naumann et al., 2020). Figure 5 shows the EU conservation status of birds, habitats, and species between 2007-2012 and 2013-2018.

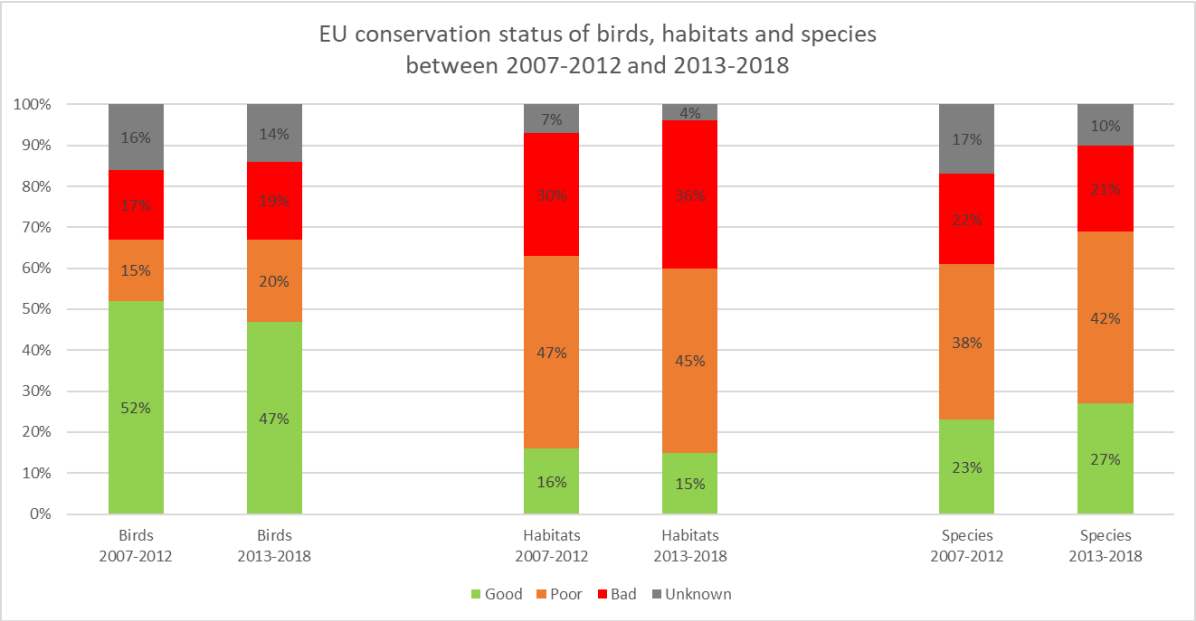

***Figure 5**: EU conservation status of birds, habitats, and species between 2007-2012 and 2013-2018 (EEA, 2015; Naumann et al., 2020)*

3.5 Governance challenges for nature management in the EU

The poor state of Natura 2000 habitats, species and birds can be explained from a governance perspective. Governance is a term for the patterns that arise in steering society: the interaction between the state, society, and the market, aimed at achieving specific policy goals (Baker, 2012; Jordan et al., 2012).

To recover from the devastating consequences of WWII, the EU's initial focus was to establish a common market and economic growth, and improve human well-being (Jordan et al., 2012). Major policy changes led to rapid economic growth, but was also accompanied by environmental problems (Spangenberg, 2012). These problems were addressed with sectoral policies with a long-term focus on economic and social growth (Jordan et al., 2012). However, over time it became clear that the implementation of the various policies, and the realization of the separate policy goals became more and more difficult because of conflicts between adjacent policies. Measures on behalf of policy goals from one sector created or enlarged problems for the realization of policy goals from another sector (Beunen et al., 2009; Ledoux et al., 2000; Mermet et al., 2010; Tosun & Lang, 2017). This led to vertical and horizontal governance problems: problems in coordination between actors at different levels (vertical), and coordination between various policy sectors (horizontal), and a greater emphasis was put on cooperation between and outside of governmental institutions. Stakeholder engagement, also known as participation, became more and more important to cross the sectoral policy borders, integrate often conflicting interests, and reach a certain degree of policy integration or to optimize the realization of the separate policy goals that had to be achieved (Sterling et al., 2017; Beunen & De Vries, 2011).

Studies have shown that the progression of the Natura 2000 conservation goals is hampered by the negative influence of many other EU policy fields and a lack of cross-sectoral policy (EEA, 2019a; European Commission, 2017). It is often suggested to optimise participation and policy integration by using an integrated approach to improve the realization of the conservation goals (Blicharska, Orlikowska, Roberge, & Grodzinska-Jurcak, 2016; Sterling et al., 2017; Kovács et al, 2017; Gallo et al., 2018; Brescansin et al., 2016; Beunen & De Vries, 2011; Jones-Walters & Çil, 2011).

The EU has grown over time and with increasing European integration the number of actors has increased and the roles of the actors have changed. To properly implement EU policy within the EU Member States, both vertical and horizontal coordination is required. Vertical coordination involves the coordination of policies and resources between actors at higher and lower levels of scale (EU, national government, regional governments and other non-government institutions). Coherence, compatibility and complementarity of policy and activities are coordinated across the various layers. Horizontal coordination involves aligning various policy sectors (Baker, 2012). Figure 6 demonstrates a schematic representation of vertical and horizontal coordination in the EU.

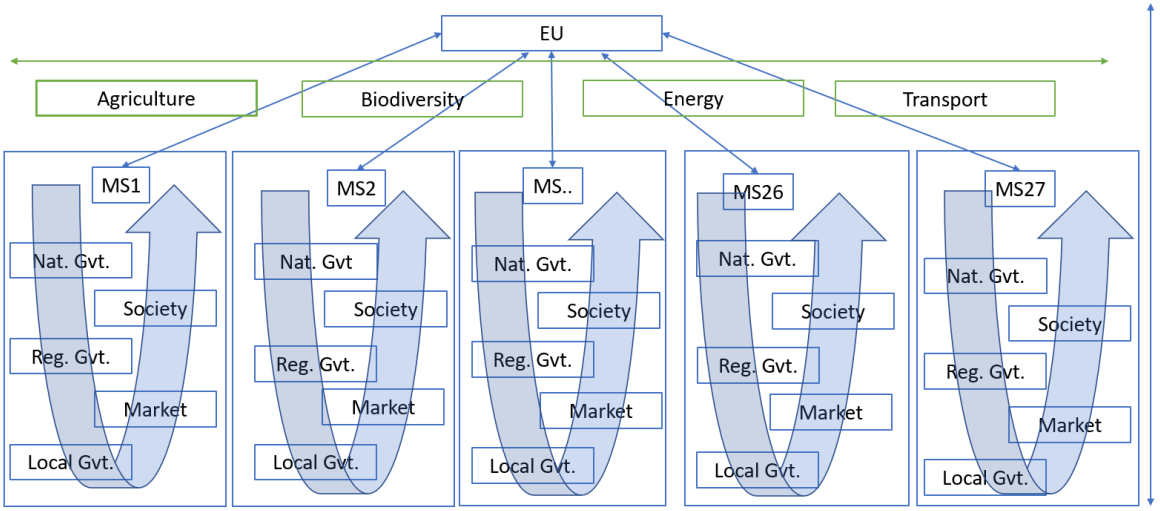

***Figure 6**: schematic representation of vertical and horizontal coordination, including participation and policy integration (green represents horizontal coordination and policy integration, blue represents vertical coordination and participation between actors)*

Modern governance in the EU has placed emphasis on a more coordinating role for the State. Member States have ceded powers upwards to the EU, where coordination must take place between 27 Member States with different backgrounds and down to national and regional governments. This involves coordination with various economic, social and environmental organisations, whose influence has been increasing, leading to tensions and problems in the political process. The actors and coalitions associated with each level of government bring their own problem definitions, means of power and ways of interacting with them (Van der Zouwen & Van Tatenhoven, 2002). Governments and other actors have become dependent on each other, but are not always equally competent in implementation, and the complex networks that have arisen at a lower level often also have problems in the political process in terms of coordination and steering (Baker, 2012; Milward & Provan, 2003). Governance in the modern world is therefore more and more about steering society by coordinating activities, and interaction between public and private sectors, over multiple layers and structures (Baker, 2012; Klúvanková-Oravská & Chobotová, 2013).

These new dimensions of governance provide dynamics and innovation in the policy arrangements: several actors discuss several levels of scale and implementation of policy is increasingly the result of negotiations and agreements between actors at different levels of scale, where powers from the State are shifted downwards. If there is a difference in the nature in which European policy is drawn up and the way it is delegated, implementation problems can arise (Van der Zouwen & Van Tatenhove, 2002).

The various environmental problems that have arisen since the development of the EU are targeted by largely independent sectoral environmental policies. The realization of nature policy goals has proven to be challenging in particular because of the negative influence of many other EU policy fields and a lack of cross-sectoral policy (Jordan et al., 2012; Mermet et al., 2010; Spangenberg, 2012). Measures on behalf of policy goals from one sector can create or enlarge problems for the realization of policy goals from another sector (Mermet et al., 2010).

There is growing realisation that the process of nature management needs to be improved by a coupling of nature management and social science, and an emphasis on creating consensus between (key) stakeholders (Jones-Walters & Cil, 2011; De Kraker, 2008; Blicharska et al., 2016). Engaging local stakeholders is therefore often a central feature of biodiversity conservation management (Sterling et al., 2016). This has led to a new paradigm in ecosystem management: participative ecosystem management. This is an interdisciplinary and holistic response, incorporating environmental, social and economic elements through shared decision making (De Kraker, 2008; Jones-Walters & Cil, 2011). It focuses on creating sustainable use of natural resources, ecosystem connectivity, a liveable countryside and revitalised agricultural areas (Mattijsen, 2018). Research has shown that problem solving and conflict management are significantly enhanced through participative processes (Jones-Walters & Cil, 2011).

This so called 'participation' is focussed on realising government/policy goals by a cooperative relationship between planned organization and interest groups, sharing a common understanding of, and interest and involvement in the decision-making process of the project (Vegter, 2020; FAO, n.d.). There are many different levels, qualities, and degrees of participation, and the success of an approach will depend greatly on the context in which it is applied (Arnstein, 1969; Wilcox, 1994; Shirk et al., 2012; Bixler, Dell'Angelo, Mfune, & Roba, 2015). Engagement approaches range from communication strategies where stakeholders passively receive important information (e.g. public information campaigns), to fully collaborative partnerships between different groups where knowledge is co-created (e.g., participatory action research projects).

There is also a growing realization that there is a high level of contradiction and conflict between and within environmental and other sectoral policies, developing independently of each other on large scale for more than 30 years (Mermet et al., 2013; Tosun & Lang, 2017). The sectoral policies that have been developed in response to the environmental problems are putting pressure on the realization of the policy's individual goals, to the extent that adjacent policy sectors are causing the main problems for the realization of other policy goals. Studies have shown that this is also the case for nature conservation policy, which is especially under pressure from agricultural policies, but also from the chemical, energy, transport and trade policies (Spangenberg, 2012).

To tackle the issue, there is a need to mainstream biodiversity policy, and to harmonise adjacent policy areas (Spangenberg, 2012; Tosun & Lang, 2017). This so called 'policy integration' suffers from conceptual diffuseness, often depending on the policy domain under investigation, It can be defined as the collaboration of actors from different policy sectors, in order to integrate aims and concerns derived from one policy domain into another (Lafferty & Hovden, 2003; Tosun & Lang, 2017). The sectoral organization of governance institutions seems to undermine transmission of knowledge and collaboration, and the successful design and implementation of integrated policy responses can lead to negative trade-offs and unexpected or unanticipated problems and costs to ecosystems and society (De Kraker, 2008).

To overcome the vertical and horizontal governance problems an area-oriented integrated approach is necessary to improve the conservation status of habitats and species (De Kraker, 2008; Mattijssen, 2018; Blicharska et al., 2016; Mermet et al., 2010). Ideally, all relevant stakeholders from government, society and the market will be actively involved in the design and implementation process to facilitate horizontal and vertical integration of actors and policies (De Kraker, 2008; Mattijssen, 2018).

Engaging local stakeholders is therefore often a central feature of biodiversity conservation management (Sterling et al., 2016). However, Sterling et al. (2016) found that despite several decades of calls for increased local stakeholder participation in biodiversity conservation, evidence on the effectiveness of these efforts is only beginning to emerge. Research has indicated that the greatest challenges to the functioning of the network are posed by socio-economic factors, i.e low level and

quality of public participation in implementation and management of the Natura 2000 network, and insufficient consideration of the local context (Blicharska et al., 2016). Projects studying the effect of stakeholder participation on the realisation of Natura 2000 areas in the EU have demonstrated the positive contribution of participatory approaches in resolving issues in regard to negative perceptions of the network, conflict and improving collaboration (exchanging knowledge, integrating values, and providing adequate funding), with few exceptions (Jones-Walters & Cil, 2011).

In order to optimize the development and implementation of the management of Natura 2000 areas and to improve the state of habitats and species in Natura 2000 areas the European Environment Agency (EEA) advices to apply an area-oriented and integrated approach that focusses on the connection between pressures on the Natura 2000 areas and their relationship with other sectoral policies and stakeholder interests, often in the form of land use activities in and around Natura 2000 areas, and the measures that are taken to reach the conservation goals (EEA, 2015).

3.6 Factors of success and failure

Several factors related to stakeholder engagement and policy integration have influenced the effectiveness of vertical and horizontal coordination in regards to the implementation of the BHD and the realization of its policy goals (European Commission, 2016; Sterling et al., 2017; Blicharska et al., 2016; Mattijssen, 2018; Kovács et al, 2017; Gallo et al., 2018; Brescansin et al., 2016; Beunen & De Vries, 2011; Jones-Walters & Cil, 2011): (1) availability of sufficient resources, (2) awareness of and cooperation between stakeholders, (3) having a shared responsibility and sense of urgency, (4) political commitment, ambitions, and support, (5) alignment on policy implications and management processes, (6) dealing correctly with a diversity in knowledge and interests, (7) knowledge and experience of authorities, (8) clarity about roles and responsibilities, (9) transparency, trust, reciprocity, exchange and respect, (10) strong leadership, (11) effective communication, (12) involving the right stakeholders in time, (13) using the right tools and methods, (14) a clear legal framework, (15) clear agreements on relationships to other decision-making agendas, (16) coherence between sectoral policies, and (17) integration with spatial planning.

When these factors are present in the integrated approach they can help bridge the vertical and horizontal gaps between actors and sectors. A process in which stakeholder engagement has been optimized can bridge the gap between knowledge and interests of the different actors, and enhance the feeling of involvement. A higher level of involvement can increase the level of commitment to achieve the goals from a mutual point of view. This can enhance policy integration and support the realization of the sectoral policy goals by bringing these goals to the surface and giving insight into their relationship and the influence that one sector has on the other sector (Sterling et al., 2017; Blicharska et al., 2016; Mattijssen, 2018; Kovács et al, 2017; Gallo et al., 2018; Brescansin et al., 2016).

Conversely, when the quality of a participative process is low, there is insufficient consideration of the local context, organization of institutions in a sectoral manner can create a barrier in cross-scale transmission of knowledge and collaboration, synergies between (sectoral) objectives can be lacking, and trade-offs can be inadequately considered and evaluated. This can lead to the emergence of conflicts and increase the gap between actors and sectors (De Kraker, 2008; Jones-Walters & Çil, 2011; Gallo et al., 2018; Brescansin et al., 2016; Blicharska et al., 2016).

These factors and the interplay of these factors can influence the integrated approach and determine the success or failure of the realization of nature conservation policy objectives. How these factors influence the process of development and implementation of Natura 2000 management plans and the realization of Natura 2000 conservation goals is the subject of this research.

4. Nature conservation policy in the Netherlands

The Netherlands has a long history of nature conservation (Berendse, 2016; Beunen & Barba Lata, 2021; WWF, 2020). The development of agriculture plays an important role, but also urbanisation and industrialization, amongst others, have had negative consequences for nature. This dates back to the Old Stone Age when early hunters and gatherers used the earth for their existence. Their influence on the landscape was modest. This changed with the first settlements about 5000 years ago. Small villages arose, and parts of nature were cleared to grow corn and wheat. Prosperity seemed to depend primarily on food production in the surrounding countryside. Admiration for the agricultural landscape increased which at that time still offered room for a great diversity of flowers, birds, and butterflies (Berendse, 2016; WWF, 2020). Even in the first half of the 19th century, there was still an abundance of nature in Europe and also in the Netherlands. However, the Dutch economic backwardness of the 18th century, the economic crisis of the 1930's, and the critical lack of food after World War II led to an intensification in farming, urbanization, and industrialization that brought along its environmental problems (Berendse, 2016; WWF, 2020).

The realization came that nature was increasingly under pressure, and in the 1960's nature and the protection of the value of nature became more important. The first nature law became effective in 1967. A "green wave" (Berendse, 2016) came over society, and it seemed to go well for nature. In the 80's an ambitious plan was developed, the Nature Conservation Plan, leading to the formation of the Dutch nature network , the Ecological Structure (Ecologische Hoofdstructuur (EHS)) (Beunen & Barba Lata, 2021). The goal was that the EHS would become a large network of connected nature areas with sufficient surface to protect and conserve nature by acquiring nature areas and agricultural land. The agricultural land would be transformed (back) to nature. The ambition was to expand the existing network of protected areas from approx. 450.000 ha to a total of 728.000 ha by 2018, 17% of the total area of the Netherlands. In addition, policies and laws were promoted to ensure the environmental and ecological conditions needed for nature conservation, funds were made available, public and private parties embraced the network, and governmental bodies made plans to contribute. Participation and policy integration was thereby facilitated (Beunen & Barba Lata, 2021).

Even though the process of nature development was going well, it was complicated by external factors such as increasing land prices, stagnation in the improvement of environmental conditions, and a dependency on voluntary cooperation of farmers for the realization of measures, triggering critique from farmers and society (Beunen & Barba Lata, 2021). In the 2000's a sound began to emerge that the focus of nature conservation policy was too much on ecology and insufficiently on the perceived negative impacts on economic activities, and conflicts started to arise about what constitutes nature or nature protection (Beunen & Barba Lata, 2021). This gained more and more prominence in the media and in political debates, and triggered sometimes heavy protests, particularly from farmer unions, developers and their political representatives. At the same time, governmental organizations mostly kept quiet about the dire need for nature development (Beunen & Barba Lata, 2021).

This gained momentum after another economic crisis and in 2010 the Dutch government decided to adapt the realisation strategy for nature, delegating the responsibility to the provincial authorities, and at the same time cutting the budget for nature conservation by approx. 70% (Berendse, 2016; Beunen & Barba Lata, 2021). This put drastic pressure on plans for nature development. The goal for the total surface of the nature network was reduced by 60.000 ha, to 668.000 ha instead of 728.000 ha, and the deadline was postponed to 2027 instead of 2018 (Beunen & Barba Lata, 2021). At the same time, nature conservation policy was actively weakened down by the national government, making it more difficult to prevent activities with negative effects on protected areas (Beunen & Barba Lata, 2021; Beunen & Kole, 2021).

4.1 Implementation of nature policy and governance challenges in the Netherlands

Parallel to this national development, European nature conservation policy was gradually developed and implemented with the Birds Directive (1979) and the Habitats Directive (1992) leading up to the European nature network Natura 2000. In 1998 the Netherlands transposed the obligations from the European BHD into Dutch law: the Nature Conservation Act (NCA) (Natuurbeschermingswet, Wet Natuurbescherming (since 2017)) and Flora and Fauna Act (Flora en Fauna Wet). (Rijksoverheid, n.d.-a, n.d.-b, n.d.-c; Ministerie van Economische Zaken, 2014; Beunen & Kole, 2021).

After that the designation of Natura 2000 areas started. The Minister of Agriculture, Nature and Food Quality used a designation decision to determine the Natura 2000 area, including a description of what needs to be protected (habitats, species, birds), what goals are to be achieved (maintain, improve or expand), and the exact boundary of the area to be protected (Compendium voor de Leefomgeving, 2020).

In 2005 the NCA was revised, after critique from the EC that not all protected sites were included in the protection regime, and the transposition of legal requirements fell short. To provide clarity about the consequences of the designation of the Natura 2000 areas, and the economic impact it had, the use of management plans was made compulsory in 2005 for all Natura 2000 sites (Beunen & Kole, 2021). Management plans had to be developed within three years from the designation and establishment of the areas (EEA, 2019e).

The management plans provide an ecological description of the area, including the BHD habitats and species, and the conservation goals that need to be achieved. Furthermore they describe the bottleneck problems, the current state and/or trends, and the measures that need to be taken to achieve the conservation goals for the area, and who will perform the measures. Another function of the management plans is to regulate land use activities in and around Natura 2000 areas, and it contains information about what activities are allowed in the area, without a permit. Management plans are constructed in close cooperation between owners, users, and other involved authorities like municipalities, water boards, and provinces (European Commission, 2000; EEA, 2019e; Beunen & Kole, 2021). The development of the management plans has a six years cycle. In the first management plan period (current period), the main focus is on the conservation objective, and to establish 'no deterioration'. This means that the measures during this period are aimed at preserving the current natural values. The development objective will follow after 2021, in which the aim is to further expand the habitats in surface area and/or to improve the quality of the habitats (European Commission, 2018; EEA, 2019e).

In 2009, the notion of "existing use" was added, ruling that activities that were already in place before 1 October 2005 and had not changed were exempted from the permitting requirements or an appropriate assessment even if they had a negative influence on the Natura 2000 area. It also added the suspension of permits for existing and future activities that met the criteria set out in the management plan, and carried out in line with these criteria (Beunen & Kole, 2021).

During the economic crisis of 2010, the national government adopted the Crisis and Recovery Act, proposing revisions to reduce the assumed administrative burden of environmental law, proposing to withdraw the national conservation objectives for Natura 2000 areas other than from the BHD, and introducing a separate regime to regulate all activities that contribute to nitrogen deposition on Natura 2000 areas. Additionally, the legal requirement was introduced to describe measures in the management plans that did not threaten the sustainable conservation of sites and that could be exempted from the permit procedure. It was stated that existing activities in and near Natura 2000 sites no longer required a permit if the activities did not have a significant effect on conservation goals,

and for certain projects it was no longer required to explore alternative solutions or to ask advice from the Netherlands Committee for Environmental Assessment (Beunen & Kole, 2021).

The Programmatic Approach to Nitrogen (PAN) was introduced in 2015, and new ways to facilitate the issuing of permits for the development and expansion of livestock farms were explored under pressure from agricultural interest groups, aiming for a reduction in the overall nitrogen deposition and its negative effects on protected sites, while simultaneously creating legal possibilities to allow nitrogen-emitting activities (Beunen & Kole, 2021). The PAN, the role of livestock farming, and the ecological consequences of nitrogen deposition are further explained in Ch. 4.3.

It took until 2015 for many of the management plans to be adopted, after a severely delayed trajectory with political pressure to limit the number of measures and restrictions for economic activities. Afterwards, several studies concluded that the management plans failed to meet the BHD requirements, that a lack of coherence, priority, and coordination would lead to ineffective and inefficient management plans, and that not all environmental problems were indeed addressed (European Commission, 2018; EEA, 2019e; Beunen & Kole, 2021).

There are now 161 Natura 2000 areas in the Netherlands, covering approx. 310.000 ha of the land area (9%) and 1.7 million ha (85%) in open waters (fig. 7) (Compendium voor de Leefomgeving, 2020). According to the CBD, every country had to assign at least 17% of its land area and 10% of its marine area as protected nature before 2020. Apart from Natura 2000 areas, the Netherlands has more nature areas (i.e. the Dutch Nature Network and National parks), but their status of protection is less binding than for Natura 2000. When looked only at the Natura 2000 areas, the Netherlands has assigned a total of 14,8% of the country as protected natura 2000 area, however compared to other Member States and compared to the CBD guidelines, the Netherlands has designated a relatively large water area (ca. 70%), and few land habitats (ca. 9%) (EEA, 2018; CBS, n.d.).

***Figure 7**: Natura 2000 areas in the Netherlands (EEA, 2020a)*

4.2 State of nature in the Netherlands

Even though the state of habitats and species in Natura 2000 areas in the Netherlands has slightly improved, they are in still poor shape: 89% of habitats is in a poor or bad state (was 96%), and 69% of species is in a poor or bad state (was 73%) (Naumann et al., 2020). Birds in the Netherlands that fall under the Birds Directive are in slightly better shape. Half of all breeding and wintering birds have a stable and increasing long-term trend. However, when looked into more detail, it becomes clear that some bird species are appearing, where others are disappearing (EEA, 2019a, 2019b; Naumann et al., 2020). Figure 8 shows the long-term trends of breeding and wintering birds, and the conservation status of habitats and species in the Netherlands between 2007-2012 and 2013-2018.

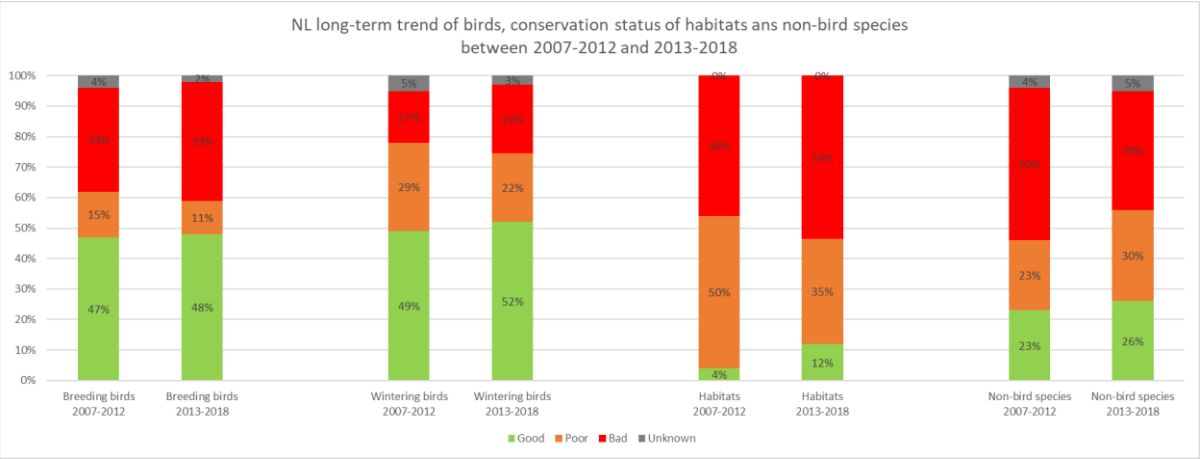

***Figure 8**: Long-term trends of breeding and wintering birds, conservation status of habitats and species in the Netherlands between 2007-2012 and 2013-2018 (EEA, 2015; Naumann et al., 2020)*

4.3 Pressures on Natura 2000 areas in the Netherlands

Human activities have caused the decline and deterioration of many habitats and species in the EU. To get more insight into cause and effect, the BHD requires that Member States report about what they consider to be the most important causes of species loss and habitat degradation. These so called pressures are factors that have affected habitats and species within the reporting period. The national summary dashboards provide information about various categories of pressure acting on birds, habitats, and species (Naumann et al., 2020; EEA, 2020b).

The Dutch national summary reports demonstrate that the main pressures on Natura 2000 areas in the Netherlands are agriculture and human-induced changes in water regimes (EEA, 2020b). Table 2 shows a more extensive overview of the main pressures on Natura 2000 areas in the Netherlands for birds, habitats, and species as reported by the Netherlands for the reporting period 2013-2018.

***Table 2**: Main pressures on Natura 2000 areas in the Netherlands for birds, habitats and species (2013-2018) (EEA, 2020b)*

Pressures	Birds	Habitats	Species
Agriculture	38%	24%	21%
Development and operation of transport systems	6%	3%	14%
Development, construction and use of residential, commercial, industrial and recreational infrastructure and areas	8%	3%	11%
Extraction and cultivation of biological living resources	13%	3%	3%
Human-induced changes in water regimes	19%	20%	15%
Natural processes	13%	18%	10%

** red is largest pressure, orange is second largest pressure, yellow is third largest pressure*

Reported agricultural activities that lead to pressures are for example the modification of hydrological flow or physical alteration of water bodies, or the application of synthetic (mineral) fertilizers (EEA, 2020b). Literature confirms that the two main pressures on the realization of the Natura 2000 conservation goals in the Netherlands are agriculture and human-induced changes in water regimes (Van der Straaten et al., 2020; Berendse, 2016; WWF, 2020; PBL, 2018). These two pressures are problematic, because they lead to high levels of nitrogen deposition and drought (Van der Straaten et al., 2020; Berendse, 2016; WWF, 2020; PBL, 2018). Nitrogen has increasingly been released into the environment as a result of many economic activities, but mainly the intensification of livestock farming. It causes atmospheric nitrogen deposition, leading to eutrophication and acidification (Gies, Kros, & Voogd, 2019; PBL, 2018; WWF, 2020). The development of water management in the Netherlands (accelerated drainage of excess water and extraction of ground water to optimize agriculture), but also other causes like the extraction of groundwater for drinking and industrial water have led to a structural drought for nature (Van der Straaten et al., 2020; WWF, 2020).

Nitrogen deposition

The largest threat to nature on land are eutrophication and acidification from atmospheric nitrogen deposition. This nitrogen deposition leads to an exceedance of the critical deposition load for nitrogen in nature areas (WWF, 2020). Nitrogen is an important source of protein for plants and animals, but an overload of nitrogen will lead to eutrophication (over-fertilization) of the soil, causing an irreversible state of exhaustion. Some plant species will grow better, at the cost of others, and nitrogen will wash out to the groundwater. The soil will acidify, reducing valuable nutrients like calcium, and magnesium. Aluminum is released which, in large amounts, can be toxic. Eventually eutrophication and acidification as a result of an overload of atmospheric nitrogen will lead to disturbance in the soil, the vegetation, and the fauna in nature areas. This is especially bad for ecosystems that are naturally nutrient-poor. Vulnerable species are disappearing and the conservation of nature in Natura 2000 is complicated (Gies et al., 2019; WWF, 2020).

Nitrogen is emitted by several sectors. The most important source is agriculture (65 – 68 %), followed by traffic (11%), and the built environment (7%). The amount of nitrogen from agriculture can be divided into Dutch agriculture (45%), and agriculture just across the border (20 – 23 %). The largest agricultural contributor is cattle farming. Emissions from stables and storage amount to 43% of the agricultural contribution, and another 30% comes from emission as a result of fertilization (Gies et al., 2019). Since the early 1990's, measure were taken to reduce atmospheric nitrogen deposition, but the reduction has stagnated since 2005. Figure 9 demonstrates the course of the emission of nitrogen per sector (Compendium voor de Leefomgeving, 2020; RIVM, n.d.; RIVM, 2019).

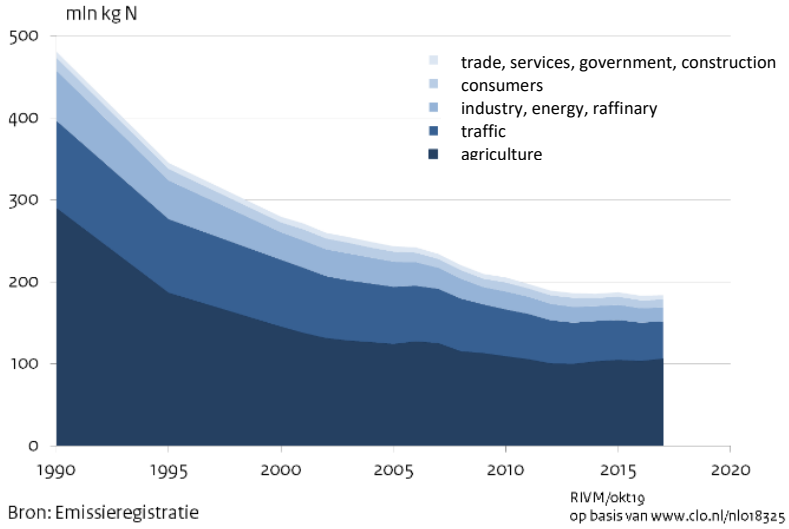

***Figure 9**: Emission of nitrogen, per sector (RIVM, 2019)*

The PAN and the nitrogen crises

From the 161 Natura 2000 areas in the Netherlands, 118 are nitrogen sensitive, meaning that the atmospheric nitrogen deposition is higher than the critical deposition load of habitats that are present. Measures to counteract the negative consequences of several decades of nitrogen deposition on Natura 2000 areas are necessary, because a natural recovery cannot be expected. To protect nature areas against nitrogen, current emissions from Dutch sources (agriculture, traffic and industry) must be reduced by at least 50 percent. This is a national average, a higher reduction is required locally for certain vulnerable areas (WWF, 2020). Local measures to actively remove nitrogen can be taken, but they cannot continue indefinitely because they cause damage to nature (Gies et al., 2019).

The excessive nitrogen deposition is harmful to nature, and because it is not permitted to conduct activities in or around a Natura 2000 area that have a negative impact on the area, it also hinders the granting of permits for economic activities that contribute to nitrogen deposition. The idea that livestock farmers in particular would no longer be able to expand their activities has played a heavy role in discussion and policy for many years (Van Straaten et al., 2020; Berendse, 2016; Beunen & Kolen, 2021).

In 2015 the Netherlands introduced a programmatic approach to nitrogen (PAN, see also Ch. 4.1) to combat the damage to nitrogen sensitive Natura 2000 areas from the exceedance of the nitrogen load, while at the same time enabling new economic activities, foremost the further intensification of livestock farming (Gries et al., 2019; WWF, 2020; EEA, n.d.; Min. BiZaK, 2019; PBL, 2018; Beunen & Kole, 2021). Technological measures to reduce nitrogen emission were introduced, and restorative measures to counteract the negative consequences of nitrogen deposition in nature were made possible by making a large amount of money available to remove excess nitrogen in nature reserves and to prevent acidification. Restoring the water level (to counteract the drought) was an important measure to improve nature. However, the PAN caused a lot of unrest among (agricultural) land owners in areas where drastic hydrological measures had to be taken, raising the groundwater level. This sometimes led to the questioning of the necessity of the measures, alternatives being sought and additional research carried out, with the risk that the acquisition of land necessary for the measures could not be acquired in a timely manner. At the same time, measures were prescribed to reduce emissions from agriculture, such as low-emission methods of fertilization and emission-free stables (Gries et al., 2019; Wereldnatuurfonds, 2020; EEA, n.d.; Min. BiZaK, 2019; PBL, 2018).

Part of the 'space' gained could be used for new activities that release nitrogen. Failure of the PAN was ingrained in the approach: new activities that cause emissions were allowed before measures for nature restoration had taken effect or before the emissions from existing activities had actually decreased. In addition, management measures to repair damage to nature did not all have the intended effect (Gries et al., 2019). Measures implemented from the PAN should have reduced the emission and deposition of nitrogen, and according to models, it would. But in practice there was no reduction of nitrogen emission, but an increase as figure x demonstrates, mostly as a result of the intensification of livestock farming and the use of artificial fertilization that had become possible after the PAN (RIVM, 2019; Schreuder, 2018). The European Court of Justice therefore ruled that the Dutch PAN was contrary to European rules for nature protection (7 November 2018). On May 29th 2019, the Council of State prohibited the authorization of new economic activities on the basis of the PAN, under which a 'mortgage on the future' was taken. Permits for new activities that cause nitrogen emissions were suspended and many construction projects were halted (Gries et al., 2019; WWF, 2020; EEA, n.d.; Min. BiZaK, 2019; PBL, 2018; Beunen & Kole, 2021).

Drought

Another large pressure on nature is drought. Drought has been recognized as one of the major drivers behind the deterioration of nature in the Netherlands for decades. A study to establish the degree of drought in the Netherlands was already carried out in 1988. In 2000 492.000 ha was in a state of drought, 257.000 ha of which was nature and goals to reduce drought were not met (Compendium voor de Leefomgeving, 2003).

A nature area is classified to be in state of drought if the amount of available (good quality) groundwater is insufficient to guarantee good quality nature, and/or if water of a different, non-regional quality must be supplied to compensate for a groundwater level that is too low or a lack of seepage pressure (Compendium voor de Leefomgeving, 2003).

In the higher parts of the Netherlands water runs off fast to the lower parts of the country, where it gets pumped away. This causes drought in the surrounding nature areas when no measures are taken. Human-induced causes of drought are: dewatering and accelerated drainage for agriculture (ca. 60%), groundwater extraction for drinking and industrial water and irrigation (ca. 30%), and other causes, such as the increase in paved surface, afforestation (= increase in evaporation) and sand extraction (ca. 10%). When the groundwater level is too low in spring, this may lead to species decline in ecosystems (WWF, 2020; Compendium voor de Leefomgeving, 2003).

Effects of drought and the supply of foreign groundwater are a loss of original plant diversity and its related, local animal species, accompanied by an increase in less sensitive plant species (Compendium voor de Leefomgeving, 2003).

4.4 Measures for Natura 2000 areas in the Netherlands

Establishing conservation measures to reduce the pressures and maintain or restore the natural habitats and populations of wild fauna and flora in the Natura 2000 sites is a mandatory responsibility of the competent authorities in each Member State. The national summary dashboards provide information about the application of conservation measures and their effectiveness for birds, habitats, and species. Measures can be taken inside or outside of Natura 2000 areas, and are practical actions to mitigate the impact of past and present pressures (fig. 10) (Naumann et al., 2020).

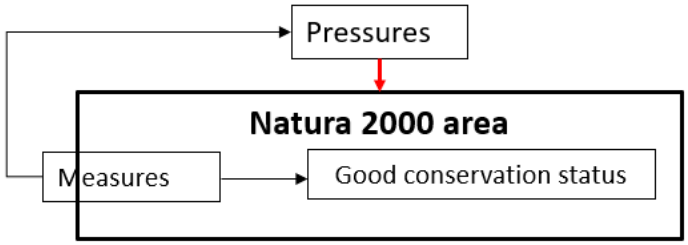

***Figure 10**: Measures described to achieve a good conservation status need to address pressures on the Natura 2000 area*

The Dutch national summary report demonstrates a few aspects of the conservation measures that are applied for Natura 2000 areas in the Netherlands:

- The distribution categories of conservation measures:
  What pressure category do the applied conservation measures address?
  This information is important to get insight into the linkage between cause and response: do the measures address the pressures?
- The location where measures are taken:

Are the measures taken inside, inside and outside, or outside the borders of the Natura 2000 area?
This information is also important to get insight into the linkage between cause and response: do the measures address the pressures at the source, or at the endpoint? Because a Natura 2000 area is protected by law, it is easiest to take measures inside of an area. However, pressures on Natura 2000 areas can find their origin inside and outside of the Natura 2000 areas. Knowing where the measures are taken and placing this in contrast with (the location of) the pressures on the Natura 2000 area gives insight into whether the measures address the source of the problem, or whether the measures reduce the impact.

- The implementation status of the measures:
  Are the measures identified but not taken or not needed?
  Are the measures applied to maintain or enhance the conservation status of bird, habitats, and species?
  This information is important to get insight into the level of ambition of the measures. The ultimate goal is to achieve a good state of conservation. Knowing the level of ambition of the measures and placing them in contrast with the current state of birds, habitats, and species is a starting point to get insight into the discrepancy between the conservation measures that are applied and the extent to which the conservation goals are achieved.

Distribution of measure categories

Figure 11 shows the distribution of measure categories among birds, habitats, and species for Natura 2000 areas in the Netherlands (EEA, 2020b).

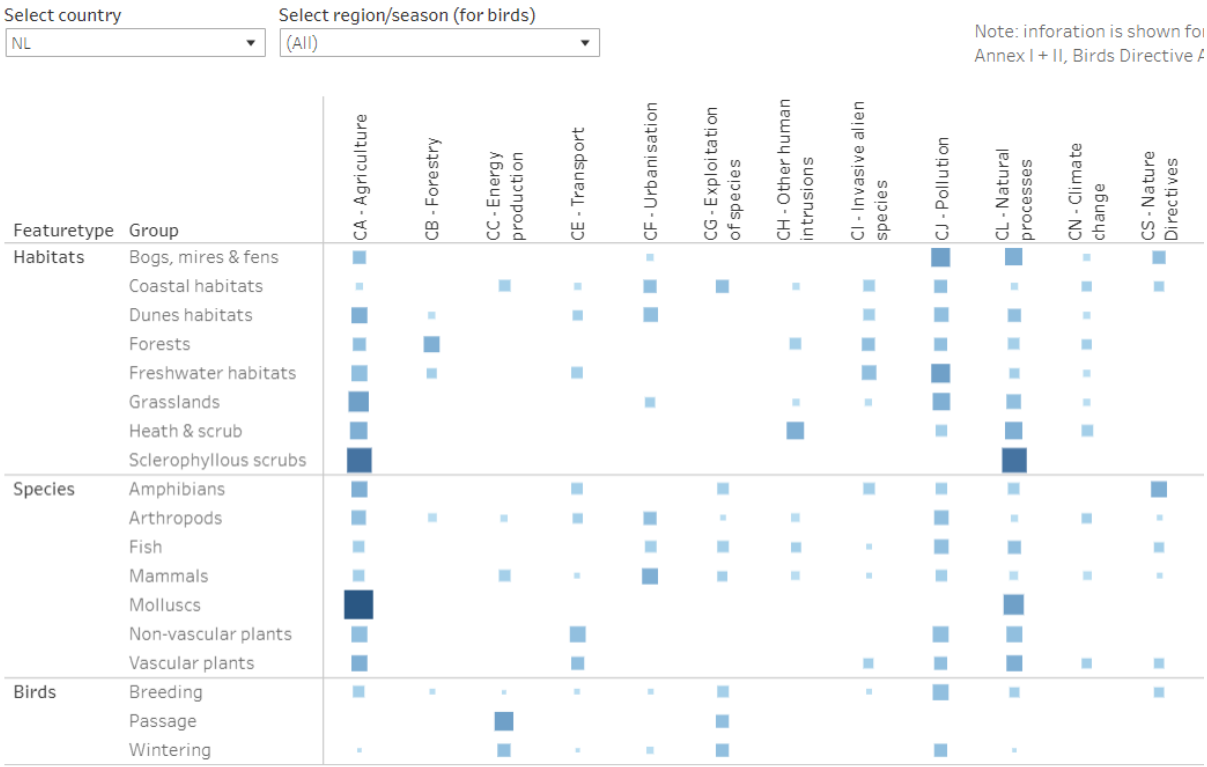

Figure 11: *Distribution of measure categories among birds, habitats, and species for Natura 2000 areas in the Netherlands (EEA, 2020b)*

The figure shows that for habitats and species most conservation measures address the pressures agriculture, pollution, and natural processes. For birds, most conservation measures address the pressures energy production, exploitation of species, and pollution. This summed up in table 3.

***Table 3**: Category of measures that are taken for birds, habitats, and species in the Netherlands (EEA, 2020)*

Measures against:	Birds	Habitats	Non-bird species
Agriculture		x	x
Energy production processes and related infrastructure development	x		
Extraction and cultivation of biological living resources	x		
Mixed source pollution	x	x	x
Natural processes		x	x

Location of measures

Figure 12 shows the main location where conservation measures are applied for birds, habitats, and species (EEA, 2020b).

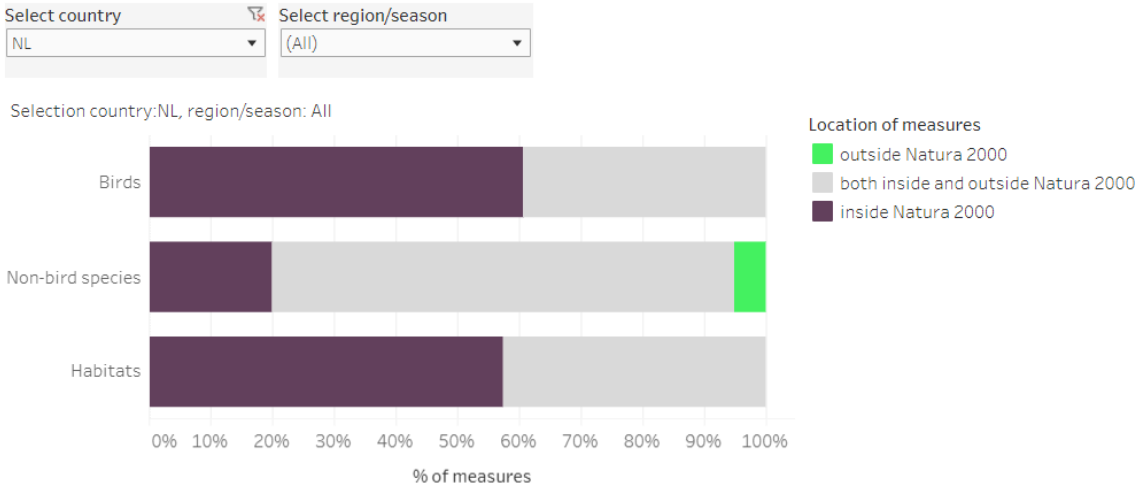

***Figure 12:** Main location of conservation measures for habitats and species (EEA, 2020b)*

The figure shows that in the Netherlands, most measures are applied inside of, or both inside and outside of Natura 2000 areas. Almost no measures are applied outside of Natura 2000 areas only.

Implementation status of measures

Figure 13 shows the main implementation status of conservation measures for birds, habitats, and species (EEA, 2020b).

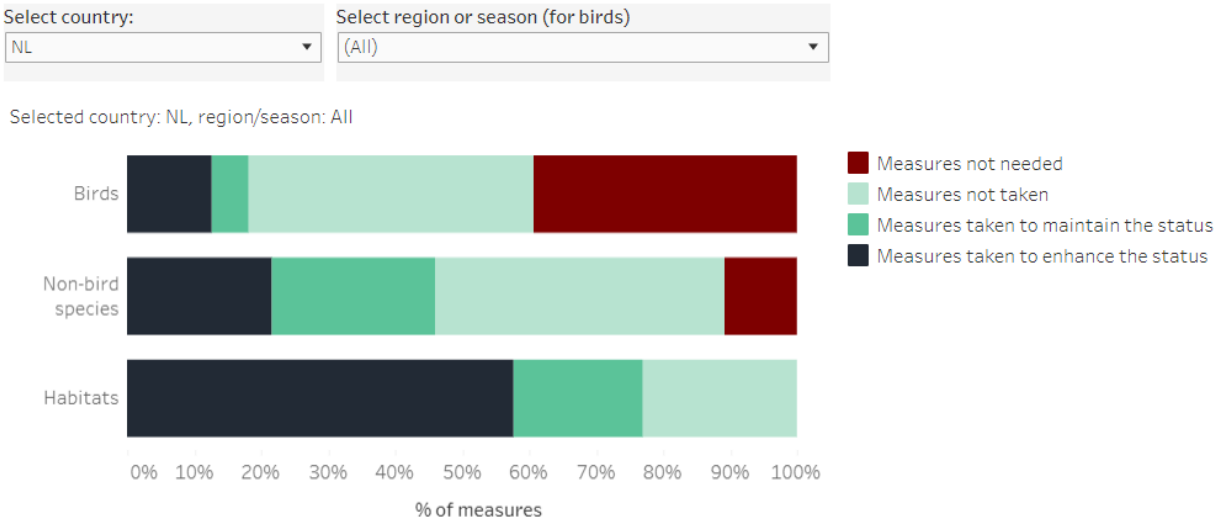

***Figure 13:** Implementation status of conservation measures (EEA, 2020b)*

The figure shows that for:

- Birds:
  - 39% of the measures are identified but not needed,
  - 43% of the measures are identified but not taken,
  - 6% of the measures is taken to maintain the status,
  - 12% of the measures are taken to enhance the status.
- Species:
  - 11% of the measures are identified but not needed,
  - 43% of the measures are identified but not taken,
  - 24% of the measures is taken to maintain the status,
  - 22% of the measures is taken to enhance the status.
- Habitats:
  - 0% of the measures is not needed,
  - 23% of the measures is not taken,
  - 19% of the measures is taken to maintain the status,
  - 58% is taken to enhance the status.

4.5 Analysis

When we look at the results from the literature and desk study we see that agriculture and human-induced changes in water regimes represent the most common pressure groups across birds, habitats and species, leading to an overload of nitrogen deposition and drought. Conservation measures that are reported in the national summary dashboard to have been applied for habitats and species address agricultural pressures, however no conservation measures are reported to have been applied to address pressures as a result of human-induced changes in water regimes.

The data in the national summary dashboard showed that a small majority of the measures described for birds, habitats and species for the reporting period 2013-2018 were taken (56%), the rest (44%) was not taken. Overall, the majority (65%) of measures which have been applied aim to enhance the current status, and 35% aims to maintain the current status. Most of the measures for birds, habitats, and species are performed inside (46%), or inside and outside (52%) of the borders of Natura 2000 areas. For habitats and birds, no measures are applied outside of the Natura 2000 areas, and for species a very small percentage of measures (5%) is applied outside the Natura 2000 areas only.

The amount of birds, habitats, and species in a good conservation status has improved slightly. However, with the exception of species, this was accompanied by a roughly equal increase in the amount of birds and habitats that were in a poor state of conservation.

The results show that the responses in regards to the measures that are taken have only slightly improved the state of birds, habitats, and species, and most measures do not address the causes that are situated outside the border of the Natura 2000 areas. From this I concluded that the cause-effect-response relationship is not yet or only partly effective. Several aspects might be key to improve the realization of the conservation goals: increase the number of measures that address all pressure groups, reduce the number of measures that have not yet been taken, increase the number of measures aimed at enhancing the status, and increase the number of measures that are taken outside of Natura 2000 areas. The next chapter will explore the processes through which measures have been identified and implemented more in-depth.

5. Management of Natura 2000 areas in North Brabant

To get a better understanding of what role increasing the number of measures that address all pressure groups, reducing the number of measures that have not yet been taken, increasing the number of measures aimed at enhancing the status, and increasing the number of measures that are taken outside of Natura 2000 areas played in the realization of the conservation goals, a case study of the Natura 2000 areas in North Brabant was performed, zooming in on six Natura 2000 management plans of areas in North Brabant. To elaborate on the data, special focus was put on the content of the management plans: what are the conservation goals, what is the current state, what pressures are reported, what measures are included in the management plan, and what is the link between the measures and the pressures.

5.1 General characteristics of Natura 2000 in North Brabant

North Brabant has 21 Natura 2000 areas (fig. 15). Nature in the Natura 2000 areas in North Brabant is characterized by a rich diversity in habitats and species. The characteristics of the areas are described below the figure.

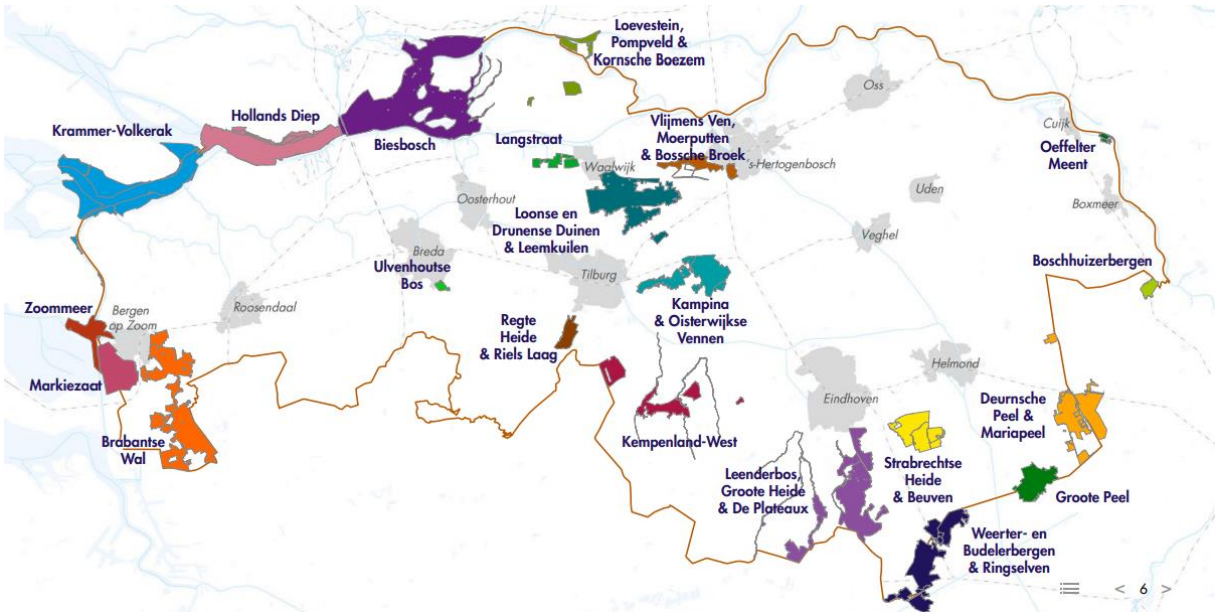

Figure 15: *Natura 2000 areas in the province North Brabant (the Netherlands) (Noord-Brabant, 2017a)*

Natura 2000 areas in the west of the province (Markiezaat, Zoommeer and Krammer-Volkerak) are characterized by a former or existing division in fresh and salt water. Zoommeer and Krammer-Volkerak used to be salt water areas, but are now fresh water areas. Markiezaat was a salt water area as well, but is now both a fresh water and a salt water area. In the future, a choice has to be made to let the area develop as a fresh or a salt water area, maintaining only the corresponding (BHD) species. Distinctive species are mainly bird species like spoonbill, Kentish plover and black-tailed godwit, but it is also home to the tundra vole (Noord-Brabant, 2017a).

Further up north, Hollands Diep, Biesbosch and Loevestein, and Pompveld & Kornsche Boezem are also wet in nature (freshwater). These Natura 2000 areas are in relatively good shape. Hollands Diep serves as resting area for ducks, geese, and swans, and when the Haringvliet floodgate is opened, it is a potential spawning ground for migratory fish. Reed, grassland and willows are common. Biesbosch is an exceptional Natura 2000 area because it is one of the few freshwater tidal areas in the Netherlands. It is home to species like the beaver, tundra vole, spined loach and weatherfish, large bitter-cress, and marsh hawk's-beard (Noord-Brabant, 2017a).

Brabantse Wal can be found on the border with Belgium. It is characterized by its large variation in landscapes and quietness. It is uniquely situated on the transition of high sandy soils to low sea clay soils, creating a great contrast, both ecologically and visually. The area has many administrators and private owners, and management of the area requires multi stakeholder, trans-border coordination of conservation goals and measures. It houses species like floating water-plantain, northern crested newt, black-necked grebe and black woodpecker. The largest problems in the area are atmospheric nitrogen deposition (eutrophication and acidification) and drought. Measures are aimed at preventing the deterioration of BHD habitats and species occurring in the area and are hydrological and ecological in nature. The area is home to nitrogen sensitive species. To mitigate the negative consequences of nitrogen deposition for these species, nitrogen recovery measures have been developed following the programmatic approach to nitrogen (PAN) (Noord-Brabant, 2017a, 2018).

Langstraat forms the transition from a river landscape with marine clay soils, low moor plains, and grasslands, towards the sandy dunes that can be found more inland (Loonse and Drunense Duinen & Leemkuilen). This creates a special hydrological and geographical situation, resulting in the occurrence of seepage water. Up until 50 years ago, it was one of the richest nature areas in the Netherlands. Eutrophication (from crop fertilization), acidification and drought have decimated these natural values. The main goal is to maintain the seeping water related nature values. To achieve this, measures are aimed at restoring the hydrological system. Measures are also taken to reduce the availability of phosphates. To mitigate the negative consequences of nitrogen deposition for these species, nitrogen recovery measures have been developed following the PAN. During this phase, priority is given to prevent the deterioration of BHD habitats of which a good state of conservation has not been reached yet. The long history of the area knows many opposing interest between nature, water, culture and agriculture. The original area plan did not sufficiently take into account the effects of farmers, companies and local residents in and around the Natura 2000 area. The Natura 2000 management plan is developed to balance the interests between the realization of the conservation goals and the many other functions in and around the area (Noord-Brabant, 2017a, 2017a).

The area 'Loonse and Drunense Duinen & Leemkuilen' has a very distinctive sandy character with a drifting sands landscape. It is surrounded by higher ground deciduous and coniferous forests, but also has stream-supporting forests, swamps, and fens that are home to species like the northern crested newt and floating water-plantain. The largest problem is the loss of drifting sand, but it also has nitrogen sensitive species. To mitigate the negative consequences of nitrogen deposition for these species, nitrogen recovery measures have been developed following the PAN. Measures for the area are mainly aimed at the recovery of the drifting sand, but hydrological measures are also necessary to realize the conservation goals (Noord-Brabant, 2017a).

Vlijmens Ven, Moerputten and Bossche Broek (VVMBB), and Ulvenhoutse Bos are seeping water areas, that are swampy (VVMBB) and wooded (Ulvenhoutse Bos). The site VVMB is home to two kinds of rare butterflies: the scarce large blue and the dusky large blue. The area mainly suffers from an unnatural water level and eutrophication (from crop fertilization). Ulvenhoutse Bos is home to the wood anemone and mainly suffers from drought, acidification, eutrophication, and bad management. Both areas have nitrogen sensitive species. Because the PAN was developed in 2015 (par. 4.1, 4.3) to mitigate the negative consequences of nitrogen deposition for these species, nitrogen recovery measures have been developed following the PAN. For VVMBB, apart from the ecological measures, measures are aimed at improving the water level. In Ulvenhoutse Bos, measures are taken to counteract drought and restore the water system (Noord-Brabant, 2017a).

Regte Heide and Riels Laag (RHRL), Kampina & Oisterwijkse Vennen (KOV), Kempenland-West (KW), Leenderbos, Groote Heide & Plateaux are characterized by their many fens and forests, but also heather, stream valleys, grasslands, and stream-supporting forests. Species occurring in RHRL, KOV, and KW are floating water-plantain, northern crested newt, and spined loach. The areas mainly suffer

from drought and the negative consequences of nitrogen deposition, like acidification and eutrophication. Leenderbos, Groote Heide & Plateaux are home to rare species like yellow-spotted whiteface, brook lamprey, woodlark and European stonechat. The area suffers from bad water quality and nitrogen deposition. All areas have nitrogen sensitive species. To mitigate the negative consequences of nitrogen deposition for these species, nitrogen recovery measures have been developed following the PAN. Measures taken in the areas mainly focus on improving the water system (Noord-Brabant, 2017a).

Strabrechtse Heide & Beuven (SHB), Weerter en Budelerbergen & Ringselven (WBR), and Boschhuizerbergen are characterized by heather and drifting sand, but also have fens that are sometimes accompanied by swamps, and coniferous forests. The areas have nitrogen sensitive species. To mitigate the negative consequences of nitrogen deposition for these species, nitrogen recovery measures have been developed following the PAN. Measures are aimed at restoring the water system and removing excess nutrients (SHB), and expanding and improving nature (WBR). Boschhuizerbergen forms the exception: this area does not contain nitrogen sensitive species and measures are not aimed at water level or nitrogen management. The area is mainly of interest because it is the largest location for the habitat type common juniper in the southern part of the Netherlands (Noord-Brabant, 2017a).

Situated on the border with province Limburg, Deurnsche Peel & Mariapeel, and Groote Peel form the remainder of an elongated primeval landscape of living raised bogs. Large scale peat extraction in the 50's and subsequent reclamation into agricultural land has changed the character of the area. The real peat formation has largely disappeared. What remains is a unique nature reserve of international class, rich in all kinds of species plants and animals like the crane, little grebe, and bluethroat, that suffers heavily from nitrogen deposition and drought. The main goals are to initiate and continue the formation of raised bogs, and to develop transition zones of active raised bogs (raised moor landscape). Almost all measures in the Natura 2000 management plans are aimed at restoring and optimising the water system. Both areas have nitrogen sensitive species. To mitigate the negative consequences of nitrogen deposition for these species, nitrogen recovery measures have been developed following the PAN and other provincial nitrogen regulations (Noord-Brabant, 2017a; DLG, 2017).

Last in line is the Oeffelter Meent. This is an area of floodplains, dry grasslands and shining oat haylands. It houses species like the little loach and the crested newt. The area is located next to the rive Meuse and is dependent on the flooding frequency of the river. The flooding frequency is hard to predict and is becoming less frequent because of measures. The main goals for the area are to enlarge and improve the stream valley grassland and shining oat haylands, and maintain the spined loach and northern crested newt. Most of the current pressures on the area are caused by the current management of the area, and are therefore relatively easy to optimise. River sand is used to create suitable locations for pioneer species. The area contains nitrogen sensitive species and is therefore part of the PAS (Noord-Brabant, 2017a).

5.2 Natura 2000 management plans in North Brabant

The management plan for Six Natura 2000 areas were studied more in depth: Markiezaat, Brabantse Wal, Vlijmens Ven, Moerputten & Bossche Broek, Ulvenhoutse Bos, Kampina & Oisterwijkse Vennen, and Strabrechtse Heide and Beuven. A detailed description of the specific Natura 2000 areas can be found in Appendix A (Dutch). Table 4 provides an overview of goals, state, pressures and measures, for each Natura 2000 area.

***Table 4**: Conservation goal, state, pressures, measures, and location of measures per Natura 2000 area*

	Conservation goal	State	Pressures	Measures	Location of measures
Markiezaat	22 birds Previously saltwater area, now closed off: both freshwater and shorebirds. The best future perspective is for freshwater and swamp birds. The first planning period focusses on a still freshwater environment with a fluctuating water level.	Ecological circumstances for some birds have detriorated. trends vary: decreasing stabilizing fluctuating increasing	fresh vs. salt water little transparanecy of surface water high phosphate levels in sediment loitering littering drug production infrstructure eel fishing inspection of cables and pipes agriculture airbase sludge depot	nature management water level management	Inside area
Brabantse Wal	6 habitats 2 species 6 birds Surface: 50% maintain, 50% improve Quality: 30% maintain, 70% improve	6 habitats: 50% good, 33% not yet optimal, 17% mediocre 2 species: 100% not yet optimal 6 birds: 33% good, 33% mediocre, 33% unknown trends vary: decreasing stabilizing fluctuating increasing	eutrophication acidification drought coordination problems (many stakeholders) afforestation repression fragmentation disturbance illegal motocross illegal dumping of drug waste	water level management nature management PAS recovery measures	Inside the area Exception: reduction of groundwater extraction
Vlijmens Ven, Moerputten and Bossche Broek	4 habitats 5 species improve the quality of habitats improve the number of species	Mainly good exceptions: floating water plantain (unknown trend) dark pimpernel bleu (probably extinct)	unnatural water level drought eutrophication water of insufficient quality	nature management water level management ecological optimization / recovery PAS recovery measures acquisition of land for: 1. ecological optimization / recovery --> reintroduction of dusky large blue 2. water level management	Inside and outside of the area A lot effort was put into the acquisition and restructuring of agricultural land to be able to improve the hydrological system and improve the ecological circumstances.
Ulvenhoutse Bos	3 habitats Enlarge and improve the moist forest types (stream-supporting forests and oak-hornbeam forests). Preserve the drier forest types (beech-oak forests with holly). Expansion of the area to moist forest types is possible on a modest scale.	mostly poor (2/3) good (1/3)	drought acidification eutrophication bad management	nature management water level management ecological optimization / recovery	Inside of the area Exception: optimizing groundwater level inside and outside of the area
Kampina & Oisteriwjkse Vennen	13 habitats 4 species 3 birds The goal is mostly to improve. In some cases to maintain.	habitats: relatively good species: mostly stable birds: decreasing (2/3), stable (1/3)	drought acidification eutrophication	nature management water level management PAS recovery measures	Inside of area Possible future exception: reduce effect of groundwater extraction for drinking water
Strabrechtse Heide & Beuven	8 habitats 1 species 4 birds Nationally, the state of the habitats, species and birds poor to bad. Goals are therefor mostly to maintain the current state.	NA	drought unnatural water level eutrophication lack of wind dynamics	nature management water level management PAS recovery measures	Inside of area Exception: Mining out of former agricultural land

The table shows that the conservation goals and state of conservation in the areas vary. Sometimes only maintaining the current state is pursued. The analysis of the management plans has shown that this was chosen because in some situations the background state of the bird, habitat or species was so low that the aim was initially to stabilize the state of conservation before improving it during phases to follow.

The management plans contain a general description of the conservation state of birds, habitats, and species. The data is not presented uniformly and it is therefore difficult to compare the state of birds, habitats, and species amongst the cases and to the national data. The overall picture shows that the conservation state is mostly mediocre or not yet optimal, but in some cases poor or good. Trends are fluctuating, from increasing to decreasing.

All Natura 2000 management plans with the exception of Markiezaat have reported acidification and/or eutrophication and drought as main problems for the area. This is in line with the results that were found in chapter 4 that show nitrogen deposition and drought are the main pressures on Natura 2000 areas in the Netherlands.

Measures that are included in the management plans show that overall there are two main categories of proposed Natura 2000 conservation measures, which are closely linked: ecological measures and hydrological measures. Ecological measures are nature management measures that are taken in the area to restructure and/or improve the state of habitats and species, like grazing, mowing, burning or cutting trees, or population regulation. Hydrological measures are mainly measures that are taken to restore characteristics of the area, like improving or restoring seepage water, but are also taken to (in)directly counteract the consequences of nitrogen deposition, like the intake of buffered water. Hydrological measures are also aimed at improving the ecological circumstances, like the recovery of fens. Most measures that are included in the management plans can be classified as hydrological measures.

Because the PAN recovery measures are measures to mitigate nitrogen deposition on Natura 2000 areas, they are often included in the list of measures that are described in the Natura 2000 management plans when nitrogen deposition is a problem for the Natura 2000 area.

Maintaining or enhancing the state of nature inside a Natura 2000 area would ideally entail applying measures to regulate the causes of the pressures and reduce the effects of the pressures. This is further explained in par. 5.3, using the DPSIR model. Because the main pressures are nitrogen deposition and drought, mainly as a result of agricultural activities (par. 4.3), measures should be aimed at regulating the nitrogen emission and the accelerated drainage and extraction of groundwater from agricultural activities outside of the Natura 2000 areas, and reducing the past and present negative ecological effects on the state of nature inside the Natura 2000 areas.

In order to be able to develop measures for a specific area that regulate the causes of the pressures on the area, it is necessary to have a clear image of the causes, for example it would be necessary to know what the causes are, where they are located and how they can be regulated. However, none of the management plans that are analysed provide a concrete description of the source(s) of nitrogen emission or the accelerated drainage and extraction of groundwater. For example:

- Brabantse Wal, Kampina & Oisterwijkse Vennen, Vlijmens Ven, Moerputten & Bossche Broek: *"The deposition on the Natura 2000 area is not only caused locally, but is the result of a multitude of causes (agriculture, industry, traffic, shipping, homes, etc.) in the vicinity of the Natura 2000 area, the province, in the Netherlands and even abroad."*
- Vlijmens ven, Moerputten & Bossche Broek:

"Drainages, ditches and extraction of groundwater for irrigation, industry and drinking water extraction are examples of interventions that have an effect on water management.

- Kampina & Oisterwijkse Vennen:
  "The drought in Kampina and Oisterwijkse Vennen is mainly caused by: lowering of the groundwater level due to drainage outside the Natura 2000 area, lowering of the groundwater level due to existing ditches within the Natura 2000 area, lowering groundwater level in Logtse Velden and Smalbroeken through the Heiloop Canal."
- Brabantse Wal:
  "Drought has various causes, such as groundwater extraction in Flanders and in the Netherlands, reduced inflow of surface water and drainage, changes in land use, drainage, drainage of forests, drainage under drainage and the retention of water on the Steertse Heide."
- Ulvenhoutse Bos:
  "Groundwater extraction in the region may play a role."

These general descriptions make it difficult to develop measures that are directly aimed at the regulation of the causes, because it remains unclear exactly what the causes are, where they are located and how they can be regulated.

As described in chapter 4, the causes of nitrogen deposition and drought are situated outside of the Natura 2000 area (agricultural activity and accelerated drainage or groundwater extraction), however these causes effect the habitats and species inside of the Natura 2000 areas. The management plan analysis has demonstrated that most measures are aimed at reducing the effect of the pressures on Natura 2000 areas, and are applied inside of the Natura 2000 areas. There are a few exceptions: three measures are included to optimize the groundwater level inside and outside of the area, one measure is included that described the mining out of former agricultural land, and Vlijmens Ven, Moerputten & Bossche Broek has put a lot of effort into the acquisition and restructuring of agricultural land.

5.3 Analysis

When we look at the results from the case study we see that measures that are proposed in the management plans are mostly hydrological measures and to a lesser extent also ecological measures. The location where the proposed measures should be taken is mainly inside the border of the Natura 2000 areas. The focus of the measures is on the ecological state of birds, habitats, and species, and the goal of the measures is to reduce the effects of the pressures on the Natura 2000 area. This has not yet led to a good state of all birds, habitats, and species in the Natura 2000 areas.

From these results, I concluded that the chosen approach is not yet or only partly effective. I used the DPSIR-model to visualize the cause-effect-response relationship (fig. 16). The DPSIR-model describes the chain of causal links, starting with the driving pressures (D) caused by human activities, through pressures (P) that are the effects of these activities, to the state of (S) and impact on (I) the ecosystems, that lead to political responses (R) like policy-making (Kristensen, 2004).

In this case the main cause (Driver) of the pressures on nature is agriculture, since it is responsible for ca. 65% of nitrogen deposition and over 60% of the removal of surface and groundwater. Other causes are traffic, urbanization and industry. The main Pressures are nitrogen emission and drainage / groundwater extraction. The higher levels of nitrogen in the environment lead to (State), acidification and eutrophication. Drainage and water extraction lead to a low water level. Both lead to a reduction in biodiversity. The Impact is a reduced quality of habitats as a result of eutrophication, acidification, and drought, leading to a bad state of conservation of birds and species, and a reduced ecological functioning inside the Natura 2000 area. The Response is nature conservation policy: the BHD and its conservation goals, the Natura 2000 areas and their management plans containing measures to improve the situation.

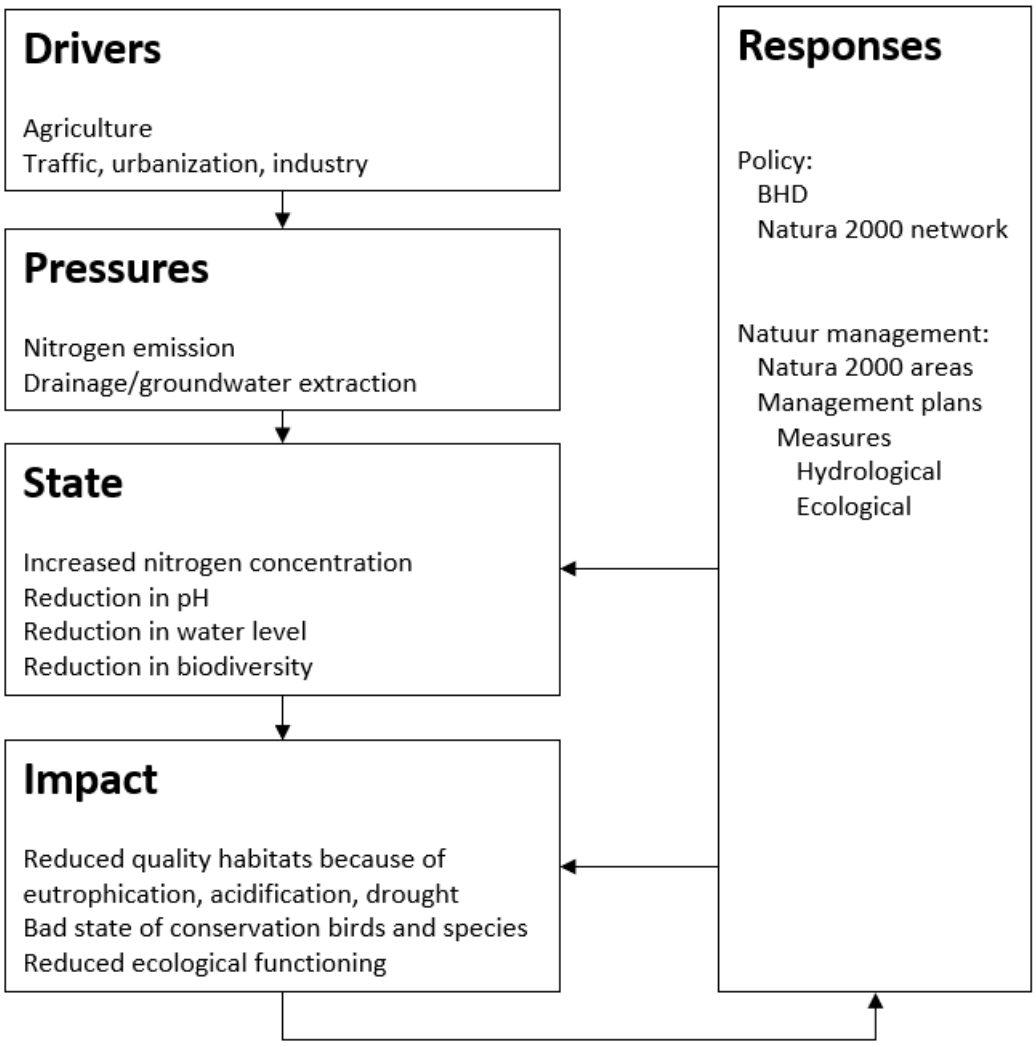

***Figure 16**: DPSIR schema for the cause-effect-response relationship for Natura 2000 in the Netherlands*

Figure 16 shows that the hydrological and ecological measures that are proposed in the Natura 2000 management plans are applied to improve the state of birds, habitats, and species in the Natura 2000 areas, and reduce the negative impact on the Natura 2000 areas. They are not aimed at the drivers and pressures and are therefore not a source approach to the reduction of driving forces or pressures on the Natura 2000 areas, but they are aimed at symptom relief inside of the Natura 2000 areas.

According to the DPSIR model, there is a causal relationship between the steering forces and the pressure exerted on the state of the environment. The impact of this ultimately leads to responses. Through the use of the DPSIR model it is possible to analyze the effectiveness of the responses that are applied.

Because this cause-effect cycle has only led to a small improvement in the good conservation status of birds, habitats, and species, I conclude that responses that are applied are not or only partly effective and that several aspects might be key to reach the conservation goals. Firstly, propose measures that are aimed at the source of the problems (drivers and pressures). Secondly, because the source of the problem is mostly located outside of the border of the Natura 2000 areas and measures that are proposed are mainly performed inside the border of the Natura 2000 areas, propose measures that are taken outside of the Natura 2000 areas.

6. Development of management plans in North Brabant

The previous chapters gave more insight into the governance side of the development of nature conservation policy and the implementation problems, and the relationship between pressures, measures and the state of nature in Natura 2000 areas. To get more insight into the underlying factors influencing the process of development and implementation of Natura 2000 policy, several people that were involved in the development and implementation of the management plans for Natura 2000 areas in North Brabant were interviewed.

6.1 Process

The interviewees explained that provinces were free to organize the development and implementation of the management plans as they seemed fit. In North Brabant, management plans for all 21 areas have been drawn up in close collaboration with the parties involved: the province, water boards, municipalities and site management organisations. The collaboration was formalized through an implementation agreement in which it is described who has what responsibility and deadlines for what must be done. The development and implementation of the management plans is divided into three six-year phases. In North Brabant the first phase initially had an emphasis on forming a cooperation structure (year 1), drawing up management plans together (year 2) and building cooperation in which cultural differences had to be overcome and people had to settle in their role (year 3).

The process was based on the participation of all relevant stakeholders. The interviewees explained that the process was not easy. Several interviewees (water board (3 people), ZLTO) perceived the process of the first few years to be slow, complex and long-winded. It was a struggle to build a functional structure because of a difference in backgrounds and interests. A few interviewees (province (1 person), water board (1 person)) underpinned that participation played an important role. An interviewee from the province stated that there was a realization that it was important and that it had to be done seriously. Another interviewee from the water board explained that stakeholders were actively involved in the tasks, the goals, the measures and the deadline, from day one. It was (made) clear that land was needed for the implementation of the measures, and stakeholders were invited to co-create a plan, so that all organizations could move forward.

Elevating groundwater levels was one of the main measures that had to be taken (water board, province). Higher water levels do not stop at the border of a nature area, and the farmers with plots of land within the sphere of influence understood very well that the increased water level in the area meant that their land would become wetter (water board (2 people)), so at the beginning there was a lot of emotion, and difficult conversations (water board (1 person)). One of the solutions to deal with this was to buy up land or to voluntarily adjust the business operations (water board (2 people), province (2 people)). Buying up land was very complex due to several factors:

- If land could not be acquired on a voluntary basis, usefulness, necessity and urgency had to be demonstrated. This was not always easy, because it was not yet fully clear what the effects of the measures would actually be (water board (2 people)).
- The land had to be purchased at market prices (water board (1 person), province (1 person)).
- If there was a purchase due to PAS measures, financial compensation for lost income had to take place in addition (water board (1 person)).

An additional problem was that although sufficient budget was available (province (1 person)), according to the province this money was compartmentalised and, moreover, the purchase of land was not seen as a measure (it was necessary to implement the measure). Expropriation/buying-out

was seen as a last resort (province (1 person), water board (1 person)) and everything happened on a voluntary basis (RHDHV). In practice, this meant that very little actually happened (RHDHV).

Farmers are entrepreneurs, and like any other entrepreneur, they are interested in a good business case (ZLTO). It did not help that at that time, it was still unclear exactly how wet it was going to be, but decisions had to be made about selling and/or moving. So, according to interviewees from the water board and the ZLTO, because of these uncertainties and complicating factors, farmers were skeptical. This already started with the fact that the farmers saw the entry into force of Natura 2000 as an instrument to give more legal body to nature policy (ZLTO). ZLTO indicated that the major consequences it had for farmers were seen as a legal battle and a trap. ZLTO experienced the process as non-transparent: there was no transparency about the measures and their consequences. In a broader sense, the ZLTO constituents questioned whether nitrogen deposition was as harmful as claimed by scientists (ZLTO). Above all, ZLTO and constituents suggested making a realistic trade-off in order to create a balance between what you want to preserve and the price it costs (ZLTO). The opinion that the conservation goals are rigid is shared by a few other interviewees from the water board or that they are very ambitious (province (1 person), water board (1 person)), and that it would be good to balance the interests between what is realistic and what is not (anymore), in order to increase the combined effort to reach the conservation goals (ZLTO, water board (1 person), province (1 person)).

6.2 Pressures and measures

All interviewees, with the exception of the ZLTO, indicated that the greatest pressure factors on nature in North Brabant are nitrogen deposition and drought, and that nitrogen deposition mainly comes from agriculture. The view that drought is also aggravated by agriculture was widely carried by almost all interviewees (province (2 people), water board (5 people), working group De Peel, Natuurmonumenten). The interviewee from working group De Peel emphasized that the permission of groundwater extractions for crop irrigation during dry periods plays a leading role in drought in de Peel areas, and the interviewee from Natuurmonumenten emphasized that the automation of the water system has caused the draining of the local systems, leading to drought of the area.

According to interviewees from the water board and the province, many of the measures to tackle the nitrogen problem were kept outside the management plans and linked to the PAN. This was deliberately chosen, because during the process it once again became apparent how difficult it was to tackle the nitrogen problem (province (1 person), water board (2 people)). Interviewees from the water board (2 people) described it as a 'wicked problem' (a social or cultural problem that is difficult or impossible to solve because of incomplete or contradictory knowledge, the number of people and opinions involved, the large economic burden, and the interconnected nature of these problems with other problems (wickedproblems.com, n.d.)). Behind it is a strong agricultural lobby (water board (1 person)) and politicians that do not seem to have an interest in changing the situation (water board (1 person), working group De Peel). Overall the tendency was that interviewees described that the political development of several decades had an influence on the current situation where economic interests have led to the situation that agriculture is being favoured above nature, and that a shift in paradigm is needed before it can be changed (province (1 person), water board (3 people), working group De Peel).

One ecologist (RHDHV) who was involved in the development of the management plans emphasised that in terms of achieving goals, the aim was to prevent decline, which was imposed from above (the ministry). According to the ecologist for the first round of management plans the instructions from the ministry were to make no intensive efforts to improve, and do the minimum. According to the ecologist this followed the economic crisis that took place at the time of Minister Henk Bleker, who reduced the budget for nature management by 70%. This made developing and implementing the management plans almost a paper exercise, where in theory it should be possible to achieve the goals (RHDHV). The

implementation of thorough measures was pushed forward, hoping for cancellation, for example to reduce the number or size of the areas, or to decrease the amount or ambition level of the goals (RHDHV).

Money that was available for Natura 2000 and made available for the implementation of the PAN recovery measures was aimed at improving the ecological situation, in particular by raising the water level (water board, province, RHDHV). This had two positive results: drought was counteracted and by raising the water level, the adverse effects of nitrogen were also reduced because it makes nature more robust, so that it was more resistant to nitrogen deposition (province, water board). However, as interviewees from the province (1 person), water board (3 people), and working group De Peel explained, this is only partly true, because the amount of nitrogen that precipitates is often so high that even "robust" nature cannot withstand it. The source is still not tackled with this. Yet, according to interviewees from the province and working group De Peel, this was necessary because nature was in such a bad state that doing nothing would mean that nature would deteriorate even further and be lost.

When asked whether all pressures are addressed by measures, one interviewee (province) explained that a risk assessment of what was achievable had been performed during the process. Measures that were deemed 'not achievable', for example because they were too complicated, too expensive, or too controversial in regards to the nitrogen situation, were kept out of the management plans, and instead, feasible alternatives for compensation were sought. "There was a very strong realization that measures are easiest to take within the boundaries of the Natura 2000 area. As a result, measures that had to be taken outside the areas were often excluded from the management plans" (province, 1 person). Often it was a continuation of existing nature management (water board (1 person)).

Most interviewees explained that the measures that are included in the management plans mainly focus on what the site management organizations could do inside the areas themselves. However, the main problems were problems that came from outside the area. Even though it is expected that the goal of no deterioration for the first round of management plans might be achieved when all ecological and hydrological inside the borders of the Natura 2000 area measures are implemented fully, the BHD requires that all BHD birds, habitats and species eventually reach a good state of conservation.

6.3 Governance

An interviewee (province) described that the Netherlands, just like the rest of Europe, has a very sectoral policy approach. This gives a lot of control, but the necessary integration takes a long time, and governments are judged on sectoral goals (province (1 person)). It also contributes to the fact that organizations stick to their core tasks, instead of looking from a broad, integral perspective (water board).

Interviewees from water board de Dommel (2 people) explained that the water board had specifically chosen to use an area-oriented approach for the development and implementation of the management plans. This meant that an inventory was made of all assignments in the area, and in this case it mainly meant that measures for the PAN, Natura 2000 and the Water Framework Directive were brought together.

As explained in Ch. 3 and 4, the BHD policy regulates activities in and around a Natura 2000 area that have a negative impact. According to interviewees from the water board (2 people) and RHDHV, the initial starting point was that current land use would also be subject to this test, but this turned out to be unworkable. Partly under pressure from the ministry, it was then decided to permit any form of current land use. This led to the decision to leave the regulation of economic activities with a high impact out of content of the management plans (water board (1 person), RHDHV). In a few cases, the

boundaries of the area itself were adjusted in such a way that the company fell outside the boundaries of the area (province (1 person)).

6.4 Solutions

Despite all the problems, the designation of the Natura 2000 areas from the BHD is considered a success by interviewees from the province and the water board. Because the areas fell under the obligations of the BHD, there was a positive impulse (time, money, direction). An interviewee from the province stated: “Even if nature is in bad shape, how much worse would it have been if nothing had been done from the BHD? Previously, nature management was tackled in a very fragmented way by many individual organizations that did their own thing, with little coordination from the province.”

Almost all interviewees (province (2 people), water board (4 people), working group De Peel, ZLTO, RHDHV, Natuurmonumenten) indicated that there is no doubt that without taking measures against nitrogen deposition and only focusing on ecology and water level management it will not be sufficient to stabilize the state of nature in the areas, let alone reach the conservation goals.

Of the six areas that were studied, only the chosen approach for Vlijmens Ven is widely considered to be successful. The Natuurmonumenten interviewee explained that the most important factors of success were: buying enough land and converting it to wet nature, in a situation where this was beneficial for all stakeholders, the coordinator had the right skills and network, the political timeframe was optimal for nature inclusive area development, the nature area already had a history of nature management so therefor there was a lot of time for the ecological development, politicians were ambitious about nature and its importance for the region, a lot of policy plans and political interest came together so there was momentum for integrated area development, this also generated sufficient funding.

When asked what the interviewee considered to be the most successful solution, all interviewees answered that scaling up to a cross-border, area-oriented approach would be needed, integrating adjacent policies and functions, riding on the momentum of large societal issues like climate change and the water transition, involve a broad range of partners with intrinsic motivation, and include the market forces by using the perceived delaying effect that nature conservation policy has on the continuation of projects and economic activities that have a negative effect on Natura 2000 areas and the drive for their continuation.

One interviewee (province) described that “sustainable system management” is required, a form of management that takes into account the system that is intertwined with the Natura 2000 area and the mutual influences, instead of focusing on measure driven ecological recovery. According to most interviewees, a solution that is future proof would consist of a source approach to reducing nitrogen deposition, water retention in the area and a structural increase in groundwater level, gradual zoning of non-conflicting types of land use around the Natura 2000 area, improving the biotic factors so natural development will follow, propagate nature inclusive agriculture, and include the value of nature in the market. Instead of working around the negative influence of current land use activities, interviewees suggested to start from the type of land use that is possible at the specific location, instead of changing the local circumstances to benefit the type of land use that is preferred .

Other solutions that were mentioned were technical adaptation: adjusting technology and/or the specific type of land use (i.e.: no longer grow potatoes, but a crop that can be grown at higher water levels), optimizing the process (planning/financing) of acquiring land/buying-out agricultural companies, using the economic momentum of the nitrogen crisis which is paralyzing important socio-economic projects, continuing to show that nature/Natura 2000 is important, and re-evaluating the level of ambition and the future perspectives throughout the zones of the Natura 2000 areas.

6.5 Analysis

When we look at the results from the interviews we see that the main pressures for Natura 2000 are nitrogen deposition and drought. The interviewees indicated that the main activity that causes problems for the Natura 2000 areas is agriculture in the vicinity of the area, for two reasons: it causes nitrogen deposition, and it requires a groundwater level that is much lower than what is needed for nature. The measures that are proposed in the management plans are aimed at improving the ecological state in the Natura 2000 areas, mainly by taking hydrological measures inside the border of the Natura 2000 areas to improve the ecological circumstances. This indicates that the proposed measures are not aimed at removing or reducing the pressures (nitrogen deposition and drought), but at improving nature so it is more resilient to withstand the pressures.

The interviews have also shown that the political goal and instruction for the first round of management plans was to maintain the current status and do the minimum. To reach this goal, an integral area-oriented process has been pursued and an attempt was made to combine various policy tasks as much as possible, with the exception of policy to mitigate nitrogen emission. The interviewees indicated that there was sufficient budget, but parts of the budget were allocated to set goals and could not always be used where needed, for example for the acquisition of land which was one of the most important actions to be able to perform hydrological measures. The interviewees also indicated that the process of development and implementation of the management plans was difficult because of the instruction to aim for the minimum demand to prevent further deterioration of BHD birds, habitats, and species in the Natura 2000 areas, instead of aiming to have all birds, habitats, and species that fall under the Directives in a good state of conservation, the different backgrounds and interests of the various stakeholders, the sectoral organization in the Netherlands, and insecurities and a lack of trust amongst the stakeholders about basic background knowledge about the main causes of the problems for Natura 2000. This may indicate that in spite of an integrated process to overcome the differences and trust issues, a lack of political commitment made it impossible to realize the Natura 2000 conservation goals.

From the results I concluded that the proposed measures are not aimed at reducing the specific pressures on the Natura 2000 areas, such as nitrogen deposition and drought, but at making nature in the Natura 2000 areas more resilient against these pressures. Because participation played an important role in the process, stakeholders were committed, and an attempt was made to integrate policy as much as possible (with the exception of nitrogen regulation) I conclude that participation and policy integration are important aspect to improve the realization of Natura 2000 conservation goals, but do not guarantee good nature protection on their own. The basis is political commitment to identify and tackle the problems for nature conservation, and ambition to pursue not only internationally agreed minimum targets, but also the ultimate goal of bringing all birds, habitats and species to good conservation status. Findings from the interviews also demonstrate that another important aspect for the realization of Natura 2000 conservation goals is a sufficient budget that is not allocated for specific targets, so that it can be used where needed.

This indicates that several factors might be key to the successful realization of Natura 2000 goals in the future: political commitment to identify and tackle the source of the problems for nature conservation, political ambition to achieve internationally agreed goals, and an adequate budget.

7. Integration of results

When we combine the results from the different phases of the research, we see that the general underlying factors that determine the success of the process that were found in the literature study have partially been confirmed by the interviews: well-performed participation, policy integration, and sufficient budget. The interviews have demonstrated several extra factors that have influenced the process of development and implementation of the management plans in North Brabant: making use of the momentum of large-scale societal issues like climate change and the water transition because these issues appeal to the same mechanisms of change, adequate funding to optimize the process of acquiring land, and using the market forces to develop nature inclusive agriculture.

The results of the desk study have added factors that determine the success of the realization of the Natura 2000 policy specifically in regards to the measures that are proposed or applied: source approach measures, implement the measures that are proposed, take measures that contribute to enhancing the amount of birds, habitats, and species that are in a good state of conservation, implement measures that are taken outside the border of a Natura 2000 area against sources of the problems for nature conservation, allow for sufficient time for ecological development because ecological development is a process that takes time to develop and become effective, use technical solutions or adjust the type of land use to the circumstances that are needed for Natura 2000 demands, and develop gradual zoning of non-conflicting types of land use around the Natura 2000 areas. Table 5 demonstrates the combined results of the research.

From the table I conclude that an integrated process with a focus on participation and policy integration is important. This is found in literature studies and confirmed by the results from the interviews. An important additional finding from the interviews was that political commitment and ambition might be a key factor for the successful realization of Natura 2000 conservation goals, as well as adequate funding.

Table 5: Factors that determine the success of the realization of the Natura 2000 conservation goal

	Factors of success	
	Literature study	**Desk study / interviews**
Process: participation	involving the right stakeholders in time	involve a broad range of partners with intrinsic motivation
	using the right tools and methods	coordinator with the right skills and network
	knowledge and experience of authorities	
	strong leadership	
	having a shared responsibility and sense of urgency	beneficial situation for all stakeholders
	awareness of and cooperation between stakeholders	
	clarity about roles and responsibilities	
	political commitment, ambitions, and support	political commitment: ambitious politicians, and policy plans and interests that come together
	transparency, trust, reciprocity, exchange and respect	trust
	effective communication	
Process: policy integration	dealing correctly with a diversity in knowledge and interests	further upscaling of the cross-border integrated approach, integrating adjacent policies and functions.
	coherence between sectoral policies	
	alignment on policy implications and management processes	
	clear agreements on relationships to other decision-making agendas	
	integration with spatial planning	
	a clear legal framework	re-evaluate the level of ambition and future ecological perspective
		make use of the momentum of large societal issues like climate change and the water
		keep showing the importance of nature/Natura 2000
Measures		Source approach: - increase the number of measures that address all pressure groups - propose meaures that are aimed at the source of the problem (drivers, pressures) - a source approach to reducing nitrogen deposition - acquiring enough land and converting it to wet nature - water retention in the area and a structural increase in groundwater level - “sustainable system management” instead of measure driven ecological recovery - start from the land use activities that are possible
		reduce the number of measures that have not been taken yet
		increase the number of measures aimed at enhancing the status
		increase the number of measures that are taken outside of Natura 2000 areas, propose measures that are taken outside of the Natura 2000 areas
		sufficient time for ecological development
		technical solution/adjustment of land use to circumastances needed for Natura 2000
		gradual zoning of non-conflicting types of land use around the Natura 2000 area
Funding	availability of sufficient resources	sufficient funding
		adequate funding
		optimize the process (planning/financing) of acquiring land/buying-out agricultural companies
		include the economic market forces, propagate nature inclusive agriculture, and include the value of nature in the market

8. Conclusions

The objective of this study is to examine the influence of the interplay of actors and sectors on the realization of Natura 2000 conservation goals. This is done by analyzing the underlying factors that influence the integrated approach in regards to the development and implementation of Natura 2000 management plans. The central question was:

How does the interplay of factors underlying the integrated process for improved development and implementation of nature conservation policy influence the success or failure of the realization of the Natura 2000 conservation goals in the Netherlands?

To reach the objective and answer the central question, the study was structured on the basis of several sub questions: How has nature policy developed? What problems are encountered in the development and implementation of nature conservation policy? What results has nature conservation led to? What factors have interfered with the management of Natura 2000 areas in North Brabant? How have these factors influenced the development and implementation of Natura 2000 management plans in North Brabant?

Findings from the different phases of the study have shown that human activity led to a rapid decline in biodiversity. The problem was addressed through nature conservation policy. In the EU, the legal cornerstone is formed by the BHD. The goal of the BHD is to form a network of protected sites that are protected by law, the Natura 2000 network. Member States are legally obliged to assign Natura 2000 areas and organize their legal protection. The minimum demand is to prevent further deterioration of BHD birds, habitats, and species in the Natura 2000 areas. The ultimate goal is to have all birds, habitats, and species that fall under the Directives in a good state of conservation.

The initial focus of the EU was on economic development to improve human well-being. Rapid economic growth led to environmental problems. These problems were addressed through sectoral policies. These policies often have conflicting goals, and measures to reach the goals from one policy can provide problems for the realization of goals from another policy. Especially when conflicting economic and political interests are involved. The main conflicting policy for nature conservation policy is formed by agricultural policy.

Problems in the development and implementation of the various policies are the result of vertical and horizontal coordination problems. The amount of actors that are involved in policy making, and the levels they act on, have increased with a growing EU, increasing the difficulty of the integration of knowledge and interests. To improve the integration of stakeholder interests and policy goals, an integrated approach is suggested. Stakeholder participation and policy integration are key aspects of an integrated approach. A properly executed participative process should facilitate the integration of interests and goals, and can therefor bridge the gap between the various policies.

In the Netherlands, problems for the realization of nature conservation policy are also the result of conflicting policies. The main problems for nature are nitrogen deposition and drought. The main cause of the problems are agricultural activities, and to a lesser extent also traffic and industry. As a response to the decline in nature, the development and implementation of nature policy in the Netherlands was initially characterized by ambitious plans to expand the total surface area of nature in the Netherlands by buying (agricultural) land and to convert it back to nature. The obligations from the BHD were integrated in overarching nature policy, and the Natura 2000 areas and the legal obligations were part of the Dutch nature policy.

The ambitions were tempered after several crises. Nature policy was stripped down by cutting the budget and shifting the responsibility for the development and implementation down to the Dutch provinces. Parallel, a focus was put on the continuation of economic activities that posed a threat to nature. Amongst others this was done by creating a programmatic approach to nitrogen emission (PAN).

To manage the Natura 2000 obligations and effects, the Netherlands had chosen to use Natura 2000 management plans. Despite the agreement on the EU level to halt biodiversity loss and reach a good state of conservation for all BHD birds, habitats, and species, during the development of the management plans the Dutch ministry instructed to do the minimum towards the realization of the Natura 2000 conservation goals, to establish that there would be no further deterioration of nature in Natura 2000 areas.

The study has shown that in the Netherlands there is a mismatch between the causes of the problems for the realization of Natura 2000 goals and the responses of Natura 2000 management. Measures that are proposed in the management plans and applied in practice, do not address the causes but are aimed at optimizing nature to be more resilient against the causes. Why this is ineffective was demonstrated by means of the DPSIR-model. The DPSIR-model showed that measures are aimed at improving nature inside the Natura 2000 areas, the State and Impact, but not at reducing or removing the problems for nature that come from outside the borders Natura 2000 areas, the Drivers and Pressures. Furthermore, almost half (44%) of the measures that were proposed were not taken.

The interviews provided insight into the process of the development of the Natura 2000 management plans in North Brabant. In North Brabant the process was performed ambitiously by using an integrated approach with a focus on stakeholder participation and policy integration. There was sufficient funding, but the budget was allocated to specific measures. However, the process was frustrated by a lack of political commitment. The top-down political focus on the continuation of economic activities that lead to nitrogen emission and the political ambitions for realization of the Natura 2000 goals to comply with the minimum demand to prevent further deterioration, created a long-winded process between the involved stakeholders, who had different background and interests. The main problem (nitrogen emission) and causes of the problem (land use activities that cause nitrogen emission) that also got in the way between the stakeholders, were kept out of the Natura 2000 management plans. Measures to mitigate the negative effects of nitrogen emissions were not included in the Natura 2000 conservation measures, but coupled to the Programmatic Approach to Nitrogen. With the remaining possibilities (no option to propose measures to address the main causes, and an inadequate budget to perform the measures), the focus of the Natura 2000 conservation measures was on making nature inside the Natura 2000 areas more robust and resilient against the negative effects from the sources.

From this study I conclude that the process of development and implementation of Natura 2000 conservation policy and the realization of the Natura 2000 policy goals is influenced by the quality of the integrated approach in general: a good quality participative process will support in overcoming a gap between stakeholder interests and sectoral policy goals. The findings from the case study in the Netherlands show that furthermore the most important factor that influences the process and the outcome is a lack of political commitment and ambition about the development of nature and the realization of Natura 2000 conservation goals. In the Netherlands this has increased the gap between stakeholder interests, and led to a gap between what needs to be done (source approach) and what is actually done (improve resilience against negative impact from source).

9. Discussion

9.1 Method – nature conservation policy

The starting point of the research was a literature study about nature conservation policy development and implementation problems and a desk study to give insight into the results nature conservation policy had led to. Because I do not have a background in nature conservation policy, it took a lot of time to get to grips with nature conservation policy and governance.

I wanted to start on a global level, and work my way down through EU and national level to a regional level, to compare the similarities and differences in the development of nature conservation policy, the state of nature, causes and responses. This was complicated, especially in the situation of defining the state of nature, I found that there are many different ways to demonstrate the state of nature. On an international level, I found the most insightful graph was a graph that demonstrated the mean species abundance on a world scale, the EU and the Netherlands up until 2000. When I tried to find more information about the state of nature after this date and in the EU and the Netherlands, I found the State of Nature in the EU report, and the underlying websites containing information at Member State level.

The main problem was that the way the data is provided through the different platforms is not unified. This only makes it possible to broadly determine the trend in the development of nature. My initial goal was to compare the results, which was not possible based on the data.

Comparing the data became more complicated even on the EU and Member State level. To provide insight into the extent to which Natura 2000 conservation goals have been achieved so far, I analysed the EU State of Nature reports from 2007-2012 and 2013-2018, and the Dutch national summary dashboards. Comparing these findings was not easy. Many categories had changed between the two periods. I identified the differences and tried to unify the data. This was a lot of work, and even though it was very interesting to identify differences and similarities, it was too much work for such a small detail of this study.

This did not influence the results of the study, because the focus of the study was on the interplay of factors that influence the process. However, time was the limiting factor. Because it took a lot of time, the research took longer and initially, it took away the focus of the study.

9.2 Method – pressures, measures, state of nature

Another way the comparison between international, national, and regional level was complicated was because it was difficult to understand and establish the relationship between the pressures and the measures that were reported in the EU State of Nature reports and national summary dashboards. Firstly, it took me a long time to understand what was meant by the pressure groups and get to grips with the underlying more specific pressure causing activities. Secondly, it was very difficult to understand what was meant by the reported measures. It took me several times of going back and forth between writing about the relationship between the measures and the pressures to understand that the main category pressures were pressure groups of overarching specific activities, and what the measure categories meant.

Furthermore, I thought it would be possible to copy the EU coding system of pressures and measures to the regional results as found from the case study. That would make it possible to compare the EU, national and regional results and establish the similarities and differences. However, I found that it was not possible to do so in absolute terms. There seems to be a lack of conformity between the way

of categorizing the pressures and measures as used in the EU reporting system and the management plans. So a comparison could only be established in general terms.

This influenced the research because I thought it would be possible to make an exact comparison between the international (EU State of Nature reports), national (summary dashboards) and regional (management plans) level, making it possible to establish the link between measures, pressures, and state of nature and point out where the connection was missing. However, the lack of uniformity in reporting made it difficult and a more in-depth study was needed to establish the connections.

In order to be able to compare and improve information about the ecological effects of nature conservation policy in the EU (within and between Member States), I would recommend to conduct further research about unification of reporting categories by establishing a link between the goal of reporting and the EU reporting categories. This could enhance the possibilities to compare the results of the different EU State of Nature reporting periods, and make it easier to get more insight into the cause-effect-response relationship on Member State level. Member States can use this to optimize their own responses, and comparisons between Member States can also become simpler and more unambiguous.

Furthermore I would suggest that the content of the management plans in regards to the description of the pressures, measures, and state of nature is aligned with the EU reporting categories. In this way it becomes possible to improve the "plan, do, check, act-cycle" by establishing the goal, plan what is necessary to get to the goal (measures), implement the measures, check the results the measures have reached, and adjust the actions for the next round. When reporting is based on the same units during the phase of planning (management plans) and checking (EU reports), it will be easier to pinpoint what is going well, and what can be improved.

9.3 Method - Interviews

The interviews were conducted after the literature and desk study, and during the case study phase, but before the case study phase was finalized. In hindsight it would have been better to finish the case studies before conducting the interviews. This would have made it possible to get more specific questions and answers to questions, in regards to the specific cases.

The interviewees were selected through snowballing: I searched for names from people that were involved in the development and implementation through documentation I was able to find online and through my network within the organizations, starting with the province. These people provided more names and contact details for other people to be interviewed. Because of this, interviewees from the water board were well presented, and interviewees from site management organizations and farmer interest groups were not represented as much. If the study gets repeated, it would be advisable to involve a broader division of these two groups to get more information about their perspective on the process.

9.4 Interpretation of the results

The objective of this study was to analyse the most important factors of success and failure for the realization of nature policy goals. The factors can be categorized into several categories: a properly performed integrated approach with a focus on stakeholder participation and policy integration, a source approach in regards to the problems for the realization of the Natura 2000 conservation goals, and sufficient and adequate funding to perform the measures that are necessary. In addition, this research has demonstrated the importance of political commitment and ambition.

What became more and more evident during the research is the role agriculture (intensive livestock farming) plays in relation to the problems for nature. Politics in the Netherlands has placed such a big emphasis on the continuation and further development of agriculture, that it seems that agriculture should be able to continue at all costs. Even when an integrated approach is applied in its best form, if nothing is done about the causes of the problem and the causes are only increased further by political choices, the goals will never be achieved.

Literature places an emphasis on an integrated approach (using participation to improve integration of interests and policies) to overcome problems for the implementation of policy and to improve the realization of policy goals. Factors of success are abundantly described and promoted, and they are also confirmed during this research. However, the case study has demonstrated that applying an integrated approach does not always lead to an optimal realization of policy goals. Factors of failure are not studied and/or described as abundantly in the literature, and I mainly found in the literature that improper participation leads to conflicts. The fact that the level of political commitment and ambition can actively frustrate the process of development and implementation of nature conservation policy and determine the depth at which the measures intervene, and therefore the level to which the nature policy goals are achieved is not broadly documented in literature.

The longer a lack of political commitment and ambition supports the continuation of the causes of the problems and can actively prevent that necessary actions are taken, the more difficult it becomes to achieve the goals. The problems will only increase, the necessary investments to achieve the goals will only become higher, and the gap between stakeholder interests and policy goals will only increase.

Therefore I would recommend that further research is performed about the causes of the lack of political commitment and ambition, establish what is needed to bridge the gap between the conflicting interests, and increase the level of political commitment and ambition. In this way factors that can contribute to the improvement of the political commitment and ambition can be determined.

9.5 Upscaling of the cross-border integrated approach

Interviewees indicated that further upscaling of the cross-border integrated process is an important factor of success. This makes it easier to develop an area and implement measures that would otherwise be conflicting. However, I found that is approached from an emphasis on measure integration, and not on policy integration. There is a risk that policy integration is complicated by making management of the area too big and complex. Currently, the various sectoral policies have different stakeholders, implications and timeframes.

Another footnote is that this is only profitable, when upscaling of the integrated approach is used to address the cause of the problem. The cause of the problems should be integrated into the complete picture of the situation to visualize what is the problem, and what is necessary to solve the problem. When upscaling is influenced in such a way that the root causes are not taken into account, and the process is used to avoid or delay having to address the cause of the problem, further upscaling will also have its limits in terms of effectiveness.

The research has shown that bringing all this together is not an easy task, and it is different for every project. I would suggest that study needs to be done to provide more insight into factors that support choices to define the right scale of an area-oriented integrated approach.

9.6 Location

For this research, I chose to study Natura 2000 areas in North Brabant. Each province was free to determine their own approach, and each province has its own political coloring. Findings are therefore

based on experiences and outcome that are, to a certain extent, typical for North Brabant. Similar to this, each Member State is free to determine their own approach, and each Member State has its own political coloring.

In order to establish whether the findings from this study are similar or different in other regions and in other situations, and to establish whether this means that the findings can be generalized and integrated into the scientific knowledge, should be adjusted or rejected, I would suggest to repeat this study in other provinces of the Netherlands, and other Member States of the EU.

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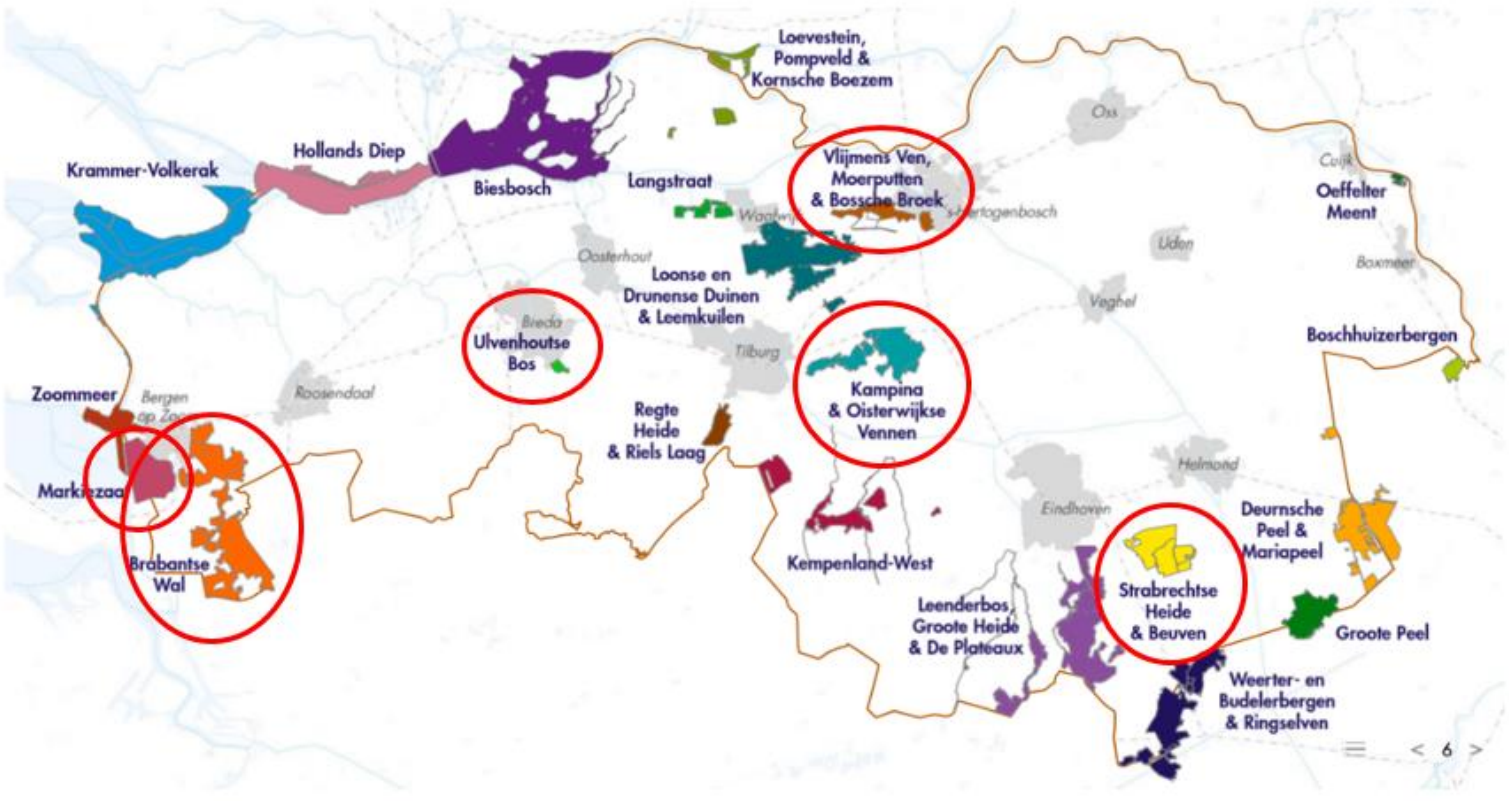
Appendix A: Analysis of Natura 2000 management plans in North Brabant



Knelpunten, instandhoudingsdoelstellingen en maatregelen

Case study van knelpunten, doelstellingen en maatregelen van Natura 2000 gebieden in de provincie Noord-Brabant (NL)

ABSTRACT

This document contains case descriptions of several Natura 2000 areas in the province Noord-Brabant. It includes a short description of area-specific problems, conservation goals and measures. The information will be used to analyze the process of problems, conservation goals and measures.

K.J. van Noppen

Inhoudsopgave

Natura 2000 in Noord-Brabant

	habitats	soorten	problemen	stikstofgevoelig	maatregelen
Langstraat	zandgronden rivierlandschap zeekleigronden ontgonnen laagveenvlakte met langesmalle graslanden begrensd door elzen trilvenen kalkmoerassen blauwgraslanden	welriekende nachtorchis moeraswespen geelhartje gele en blonde zegge alpenrus grote modderkruiper	vermesting verdroging	ja, PAS	waterpeil verhogen bemesting beperken toplaag verwijderen
Kampina & Oisterwijkse Vennen	licht glooiend landschap met bossen vennen bijzondere graslanden en heide beekdalen vennen natte heide schraallanden blauwgraslanden oude bossen	drijvende waterweegbree kamsalamander taigarietgans	verdroging verzuring door stikstof- depositie vanuit landbouw inddustrie verkeer	ja, PAS	Herstel waterstructuur Natte Natuurparel
Kempenland-West	droge, vochtige en natte heidgronden vennen laagland-beken en beekgeleidende bossen	zeldzame drijvende waterweegbree kleine modderkruiper	verdroging stikstofdepositie	ja, PAS	waterhuishouding verbeteren Natte Natuurparels Natte heide vegetatiebeheer verwijderen invasieve exoten recreatie beperken
Vlijmens Ven, Moerputtem en Bossche Broek	moerassig veel sloten kwelwater grote zeggenmoerassen glanshaverhooilanden blauwgrasland	kranswieren 2 soorten pimpernelblauwtje	onnatuurlijk waterpeil vermesting	ja, PAS	Natuurherstel verbeteren waterpeil
Brabantse Wal	stuifzanden naald- en gemengde bossen heide vennen	drijvende waterweegbree kamsalamander geoorde fuut dodaars nachtzwaluw boomleeuwerik zwarte specht wespendief	verdroging slechte waterkwaliteit	ja, PAS	vernatten waterkwaliteit verbeteren
Loonse en Drunense Duinen & Leemkuilen	levende zandverstuivingen omringd door hoger gelegen loof- en naaldbossen beekgeleidende bossen en moerassen vennen stuifzanden droge heideoude eikenbossen	kamsalamander drijvende waterweegbree	verlies stuifzand	ja, PAS	stuifzanherstelplan terugdringen invasieve exoten
Regte Heide en Riels Laag	hooggelegen heide met vennen laaggelegen beekdal met vennen en beekgeleidende bossen		verdroging vermesting verzuring	ja, PAS	watersysteem herstellen in en rond gebied --> grondwaterpeil omhoog recreatie
Markiezaat	Voorheen zout, nu zout en zoet toekomst: keuze	lepelaar dodaars grauwe gans wintertaling strandplevier kluut	keuze zoet of zout betekent verdwijnen bijbehorende soorten		t.b.v. keuze: watersysteemanalyse
Loevestein, Pompveld en Kornsche Boezem	polder met moerassen, sloten en vochtig grasland polder met wilgenbosschage	bittervoorn kleine modderkruiper grote modderkruiper			Onderhoud aan waterlopen verbetering oppervlaktwater- kwaliteit aanleg nieuwe sloten en natuur verbinding natuurgebieden
Leenderbos, Groote Heide & Plateaux	heidevelden beekdalen visvijvers vloeivelden bossen	gevlekte witsnuitlibel beekprik bittervoorn nachtzwaluw boomleeuwerik roodborsttapuit	waterkwaliteit stikstofdepositie	ja, PAS	herstel waterhuishouding
Deurnse Peel & Mariapeel	levend hogveen	kraanvogels dodaars blauwborst geoorde fuut porseleinhoen		ja, PAS	waterhuishouding verbeteren
Groote Peel					
Hollands Diep	Potentieel paaigebied voor trekvissen rustplek voor eenden, ganzen en zwanen zachthoutooibossen rietruigtes slikke rivieroevers grasgorzen	bever noordse woelmuis kluut			
Biesbosch	Eilanden en kreken, wilgenbos, struwelen, ruigten, rietlanden, graslanden, stroomdalgraslanden Eén van de weinige zoetwatergetijdengebieden in NL Uitgestrekte wilgenbossen	Spindotter bittere veldkers moerasstreepzaad noordse woelmuis tonghaarmuts bever			vergroten getijdenslag
Boschhuizerbergen	stuifduinen jeneverbesstruwelen naaldbos en stuifzand				
Weerter en Buderelbergen & Ringselven	Aaneengesloten naaldbosgebied, heide- en stuifzandterrein Vengebied, omgeven door moeras Berken- en elzenbroekbossen, met enkele vennen gelegen langs de Tungelroysche beek		waterhuishouding	ja, PAS	uitbreiding en verbetering natuurwaarden
Krammer-Volkerak	voorheen zout, nu zoet zilte pionierbegroeiingen zilte graslanden vochtige duinvalleien ruigten en zomen met wilgenroosje zachthoutooibossen essen-iepenbossen	Noordse woelmuis bruine kiekendief bontbekplevier strandplevier visdief grutto tureluur			bestaand beheer voldoende
Zoommeer	voorheen zout, nu zoet				
Strabrechtse Heide & Beuven	Heideven dekzandlandschap stuifzandlandschap afwisseling droge stukken met heide, stuifzanden en natte heide met vennen			ja, PAS	herstel waterhuishouding verwijderen overmaat voedingsstoffen
Oeffelter Meent	uiterwaarden droge graslanden glanshaverhooilanden	kleine modderkruiper kamsalamander		ja, PAS	
Ulvenhoutse Bos	natte broekbossen eiken-haagbeukenbossen kwelwater	bloeiende bosanemonen	verdroging verzuring vermesting verkeerd beheer	ja, PAS	Tegen verdroging watersysteem herstellen bosbeheer aanpassen

Langstraat

zandgronden, rivierlandschap, zeekleigronden
ontgonnen laagveenvlakte met lange smalle graslanden begrnsd door elzen
trilvenen, kalkmoerassen en bluawgraslanden
welriekende nachtorchis, moeraswespen, geelhartje, gele en blonde zegge, alpenrus, grote modderkruiper

vermesting, verdroging

waterpeil verhogen, bemesting beperken, toplaag bodem verwijderen
stikstofgevoelig → PAS

Kampina & Oisterwijkse Vennen

Licht glooiend zandlandschap met bossen, vennen, bijzondere graslanden en heide
Beekdalen
Vennen, natte heide, overgangen naar schraallanden
Blauwgraslanden en oude bossen

Afhankelijk van water → Natte Natuurparel

Drijvende wwaterweegbree, kamsalamander, taigarietgans

Verdroging en N-depositie
Landbouw, industrie en verkeer → verzuring van de bodem en ondiepe grondwater

PAS
Herstel waterstructuur

Kempenland-West

Droge, vochtige en natte heidegronden, vennen, laagland-beken eb beekgeleidende bossen
Zeldzame drijvende waterweegbree, kleine modderkruiper

Waterhuishouding verbeteren
→ Natte Natuurparels
Naaldbos → omgevormd naar natte heide

Vegetatiebeheer
Verwijderen invasieve exoten
Recreatie beperken
Stikstofgevoelige soorten → PAS

Vlijmens Ven, Moerputten en Bossche broek

Moerassig, veel sloten en kwelwater
Kranswieren, grote zeggenmoerassen, glanshaverhooilanden, blauwgrasland,
2 soorten pimpernelblauwtje

Onnatuurlijk waterpeil, vermesting op agrarische gronden
→ (2) projecten opgestart voor natuurherstel
→ PAS
→ Verbeteren waterpeil

Brabantse Wal

Stuifzanden, naald- en gemengde bossen, heide en vennen
Drijvende waterweegbree, kamsalamander, geoorde fuut, dodaars, nachtzwaluw, boomleeuwerik, zwarte specht, wespendief

Verdoging, slechte waterkwaliteit
→ vernatten, waterkwaliteit verbeteren
→ stikstofgevoelige soorten → PAS

LD Duinen & Leemkuilen

Levende zandverstuivingen omringd door hoger gelegen loof- en naaldbossen
Zuiden: nattere gebieden. Beekgeleidende bossen en moerassen
vennen, stuifzanden, droge heide, oude eikenbossen en bossen langs beken
kamsalamander, drijvende waterweegbree

Stuifzandherstelplan →
Door intensieve begrazing en plaggen van heide (vanaf 14^{e} eeuw) stuifzanden steeds groter. Tegen stuiven: aanplant eikenbomen en naaldbomen. → gebied veranderde voor groot deel in bos
Om heide en stuifzand in gebied te behouden → ingrijpende bomenkap

Terugdringen invasieve exoten

Stikstofgevoelige soorten → PAS

Regte Heide en Riels Laag

Aaneengesloten overgang van heide naar de beek over een lengte van 3 kilometer met hoogteverschil 5 meter
Hooggelegen heide met zure vennen, gaat over in laaggelegen beekdal met zwakgebufferde vennen en beekbegeleidende bossen

Maatregelen → water
Gebied is verdroogd
Waterkwaliteit te leiden onder vermesting en verzuring
In en rond natuurgebied grondwatersysteem herstellen → grondwaterpeil op plaatsen omhoog

Recreatie → Ook maatregelen om verstoring kwetsbare soorten te voorkomen

Stikstofgevoelige soorten → PAS

Markiezaat

Markiezaatsmeer = grootste gedeelte
Vroeger in directe verbinding met Oosterschelde
Aan oevers: moerassen, riet, wilgenbosschage
Overgangen:
Van nat naar droog
Van zoet naar zout
Van voedselarm naar voedselrijk
Van kaal naar begroeid

Daardoor veel verschillende (zeldzame) vogels:
Lepelaar, dodaars, grauwe gans, wintertaling, strandplevier, kluut

Keuze: of zoet, of zout → bijbehorende vogelsoorten zullen blijven
Instandhoudingsdoelen voor vogels zowel zoet als zout
→ keuze onderbouwd maken → watersysteemanalyse

Maatregelen Voorlopig
Zoete omstandigheden, stagnerend water, fluctuerend peilregime
Aanpassingen bestaand begrazingsbeheer

Loevestein, Pompveld en Kornsche Boezem

Pompveld: Polder met moerassen, sloten en vochtig grasland. Met eigen waterhuishouding
Kornsche Boezem: kleine polder met veel wilgenbosschage
Zeldzame vissoorten, zoals bittervoorn, kleine en grote modderkruiper

Vooral voor grote modderkruiper maatregelen
Onderhoud aan waterlopen, verbetering opp.w.kwal., aanleg nieuwe sloten en natuur, verbinding natuurgebieden

Leenderbos, Groote Heide & de Plateaux

Heidevelden, beekdalen, visvijvers, vloeivelden, bossen

Waterkwaliteit en stikstofdepositie
Groot deel afhankelijk van voedselarme en/of natte omstandigheden.
→ herstel waterhuishouding nodig

Door te hoge N-dep. Veel zeldzame soorten verdwenen uit stuifzanden, heiden, vennen en bossen
→ PAS

Maatregelen:
Maaien, begrazen, kappen van bomen, plaatselijk verwijderen van stikstofrijke toplaag van de bodem
Sloten afdammen, meandering,

Gevlekte witsnuitlibel,
beekprik, bittervoorn,
nachtzwaluw, boomleeuwerik, roodborsttapuit

Deurnsche Peel & Mariapeel

Groote Peel

Restant uitgestrekt oerlandschap van levend hoogveen
Voor herstel en kwaliteitsverbetering → waterhuishouding op orde!

Kraanvogel, dodaars, blauwborst, Geoorde fuut, porseleinhoen

Stikstofgevoelige soorten → PAS

Hollands Diep

Potentieel paaigebied voor trekvissen
Belangrijke rustplek voor eenden, ganzen en zwanen
Broeden: lepelaars, kluten

Zachthoutooibossen (grienden), rietruigtes, ‘slikke rivieroevers’en grasgorzen

Bever, noordse woelmuis

Het gaat goed met bever, lepelaar, en bijna alle niet-broedvogels
Ook trekvissen (mits Haringvlietsluis op kier)
Maatregelen voor verbetering noordse woelmuis en voldoende geschikte broedgebieden voor kluut

Biesbosch

Eilanden en kreken, wilgenbos, struwelen, ruigten, rietlanden, graslanden, stroomdalgraslanden
Eén van de weinige zoetwatergetijdengebieden in NL
Uitgestrekte wilgenbossen

Maatregelen:
Vergroting getijdenslag (verschil hoog en laag water)

Spindotter, bittere veldkers, moerasstreepzaad, noordse woelmuis, tonghaarmuts, bever

Boschhuizerbergen

Stuifduinen
Vooral: jeneverbesstruwelen. Daarnaast: naaldbos en stuifzand

Weerter en Budelerbergen & Ringselven

Aaneengesloten naaldbosgebied, heide- en stuifzandterrein
Vengebied, omgeven door moeras
Berken- en elzenbroekbossen, met enkele vennen gelegen langs de Tungelroysche beek

Waterhuishouding
Maatregelen nodig voor uitbreiding en verbetering natuurwaarden

Stikstofgevoelige soorten → PAS

Krammer-Volkerak

Voorheen zout, nu zoet

Habitats:
Zilte pionierbegroeiingen, zilte graslanden, vochtige duinvalleien, ruigten en zomen met wilgenroosje, zachthoutooibossen, essen-iepenbossen

Soorten:
Noordse woelmuis, buine kiekendief, bontbekplevier, strandplevier, visdief, grutto, tureluur

Geen extra maatregelen tbv stikstof.
Bestaand beheer voldoende

Zoommeer

Voorheen zout, nu zoet.

Strabrechtse Heide & Beuven

Heideven (grootste heideven van NL, bekend om waardevolle zachtwaterflora)
Dekzandlandschap, deel stuifzandlandschap
Afwisseling droge stukken met heide, stuifzanden en natte heide en vennen

Heide van goede kwaliteit. Een van de grootste oppervlakten aan (vochtige) heide in het zuiden van NL.

Maatregelen:
Herstel waterhuishouding
Verwijderen overmaat voedeingsstoffen
PAS (stolstofgevoelige soorten)

Oeffelter Meent

Uiterwaarden, droge graslanden, glanshaverhooilanden,
Kleine modderkruiper, kamsalamander

PAS

Ulvenhoutse Bos

Natte broekbossen, eiken-haagbeukenbossen
Kwelwater
Bloeiende bosanemonen

Verdroging, verzuring, vermesting, verkeerd beheer

Maatregelen
Tegen verdroging
Watersysteem herstellen en bosbeheer aanpassen
PAS

1. Markiezaat: Overzicht belangrijkste onderdelen

Kenmerken en knelpunten in het gebied

- Van origine een zoutwater gebied met bijbehorende wad- en kustvogels. Sinds afsluiting van de Oosterschelde steeds verdere verzoeting. Hierdoor ook water- en moerasvogels. De combinatie van instandhoudingdoelstellingen (IHDs) en daaraan gerelateerde watercondities voor zoetwater- en kustvogels zijn steeds moeilijker te verenigen. Ook kunnen er moeilijk maatregelen genomen worden om de afname in aantallen broedende kustvogels (strand-, bontbekplevier, kluut) met een IHDs op Deltaniveau tegen te gaan.
- Het oppervlaktewater kenmerkt zich in de huidige situatie door weinig doorzicht en hoge fosfaatgehalten in de waterbodem. Dit leidt tot bovenmatige algengroei, maar een afname van waterplanten en vis.
- Er is een dilemma m.b.t. het waterpeil. Het verlagen van het waterpeil leidt tot eerdere beschikbaarheid van broed- en foerageergebieden op eilandjes, maar door droogvallen zullen de eilandjes toegankelijk worden voor roofdieren.
- 6 april 2020: nachtelijke verstoring door hangjongeren (Iris van den Berg. (6 april 2020 maandag). Groep jongeren beboet voor samenscholing in kwetsbaar natuurgebied Markiezaat. *AD/Algemeen Dagblad.nl.* Retrieved from https://advance-lexis-com.ezproxy.elib10.ub.unimaas.nl/api/document?collection=news&id=urn:contentItem:5YKT-N9X1-JBHV-K0J0-00000-00&context=1516831.)

In de toekomst zal er een keuze gemaakt moeten worden hoe het Markiezaat zich gaat ontwikkelen en welke bijdrage aan het Natura 2000-netwerk daar bij hoort. Om deze keuze te onderbouwen zal in eerste planperiode een watersysteemanalyse worden uitgevoerd. Een visie voor de langere termijn kan pas worden gemaakt wanneer deze keuze is gemaakt. Dit plan is daarom ook vooral gericht op de uitvoeringsstrategie voor de korte termijn.

Instandhoudingsdoelen

Tabel 1: Instandhoudingsdoelstellingen voor vogels in de Markiezaat

	Minimaal aantal broedparen	**Aantal vogels per seizoen**
Dodaars	30	
Lepelaar	20	50 (seizoen gemiddelde)
Kluut	2.000 (op Deltaniveau)	140 (seizoen gemiddelde)
Bontbekplevier	105 (op Deltaniveau)	360 (seizoen maximum)
Strandplevier	220 (op Deltaniveau)	
Fuut		200 (seizoen gemiddelde)
Geoorde fuut		50 (seizoen gemiddelde)
Aalscholver		680 (seizoen maximum)
Kleine zwaan		30 (seizoen gemiddelde)
Grauwe gans		510 (seizoen gemiddelde)
Brandgans		130 (seizoen gemiddelde)
Bergeend		250 (seizoen gemiddelde)
Smient		1.600 (seizoen gemiddelde)
Krakeend		280 (seizoen gemiddelde)
Wintertaling		700 (seizoen gemiddelde)
Pijlstaart		480 (seizoen maximum)
Slobeend		150 (seizoen gemiddelde)
Meerkoet		920 (seizoen gemiddelde)
Zilverplevier		1.300 (seizoen maximum)
Kanoet		1.600 (seizoen maximum)
Bonte strandloper		6.400 (seizoen maximum)
Zwarte ruiter		210 (seizoen maximum)

Maatregelen

Tabel 2: Samenvatting van mogelijke fysieke maatregelen

Categorie	**Maatregel**	**Inhoud**	**Opmerking**
Geen-spijt maatregelen	Begrazingsbeheer	Gestuurde begrazing	
	Peilbeheer	Vergroten overlaatcapaciteit	Voordelen: eerder droogvallen = vroegere beschikbaarheid van geschikte gebieden Nadelen: deel van het gebied niet langer beschermd tegen roofdieren.
Maatregelen t.b.v. zoet scenario	Opspuiten van (nieuwe) eilandjes		
	Baggeren + opbrengen schone zandlaag		Niet zinvol voor kustvogels
	Wegvangen van vis	Brasem afvangen ivm woeling en opeten van zoöplankton (dat algengroei door grazing vermindert)	
Maatregelen t.b.v. zout scenario	Verbinding met Oosterschelde herstellen en peilfluctuaties herstellen		Maatregel om te komen tot herstel van het zoute milieu.

Markiezaat

Het gebied bestaat voornamelijk uit een meer met aangrenzende voormalige schorren en slikken. Na afsluiting van het Markiezaatsmeer van de Oosterschelde in 1983 is een ondiep brak en steeds verder verzoetend meer ontstaan. Hierna heeft het zich ontwikkeld tot een vogelrijk gebied.

Het gebied wordt gekenmerkt door overgangen: van nat naar droog, van zoet naar zout, van voedselarm naar voedselrijk en van kaal naar begroeid. Verzoeting zal, afhankelijk van peil- en waterbeheer, komende jaren nog doorgaan. Van origine kwamen er vooral zoutwatervogels voor. Vanwege de verzoeting neemt dit nu steeds meer af.

1.1 Kenmerken en knelpunten in het gebied

- Van origine een zoutwater gebied met bijbehorende wad- en kustvogels. Sinds afsluiting van de Oosterschelde steeds verdere verzoeting. Hierdoor ook water- en moerasvogels. De combinatie van instandhoudingdoelstellingen (IHDs) en daaraan gerelateerde watercondities voor zoetwater- en kustvogels zijn steeds moeilijker te verenigen. Ook kunnen er moeilijk maatregelen genomen kunnen worden om de afname in aantallen broedende kustvogels (strand-, bontbekplevier, kluut) met een IHDs op Deltaniveau tegen te gaan.
- Het oppervlaktewater kenmerkt zich in de huidige situatie door weinig doorzicht en hoge fosfaatgehalten in de waterbodem. Dit leidt tot bovenmatige algengroei, maar een afname van waterplanten en vis.
- Er is een dilemma m.b.t. het waterpeil. Het verlagen van het waterpeil leidt tot eerdere beschikbaarheid van broed- en foerageergebieden op eilandjes, maar door droogvallen zullen de eilandjes toegankelijk worden voor roofdieren.

In de toekomst zal er een keuze gemaakt moeten worden hoe het Markiezaat zich gaat ontwikkelen en welke bijdrage aan het Natura 2000-netwerk daar bij hoort. Om deze keuze te onderbouwen zal in eerste planperiode een watersysteemanalyse worden uitgevoerd. Een visie voor de langere termijn kan pas worden gemaakt wanneer deze keuze is gemaakt. Dit plan is daarom ook vooral gericht op de uitvoeringsstrategie voor de korte termijn.

1.2 Huidige activiteiten

Huidige activiteiten in en rondom het Markiezaat zijn goed verenigbaar met de IHDs voor het gebied.

- Begrazingsbeheer.
- Recreatie: weinig.
- Infrastructuur: in gebied geen. Wel in de directe omgeving.
- Jacht, wildbeheer, schadebestrijding: muskusrat- en konijnenbestrijding. Vos in opkomst, kan bedreiging vormen voor IHDs → dan beheerjacht.
- Beroepsvisserij: paling.
- Enkele kabels en leidingen doorkruisen het gebied. Worden regelmatig vanuit de lucht geïnspecteerd.
- **Agrarisch gebruik: alleen in zuidoosthoek (voor beweiding). Buiten N2000 gebied neemt intensiteit af, mede door ontpachting.**
- Waterberging: geen functie, wel opslag overtollig water / overstortwater.
- Gebruik luchtruim: Vliegbasis Woensdrecht. Veel vliegbewegingen.
- Berging slib: slibdepot. Plan om af te graven en her in te richten (Brabants Landschap).
- Windmolens: 26 windmolens aanwezig. Geen negatieve effecten op aangewezen VHR soorten.

1.3 Instandhoudingsdoelen

- 22 vogelsoorten: water- en moerasvogels, wad- en kustvogels.
- Ecologische omstandigheden verslechterd voor aantal vogelsoorten.
- Beste omstandigheden voor zoetwater- en moerasvogels → zoetwater met wisselend peilregime.
- Om ook bij te kunnen dragen aan IHDs voor kustvogels zou afsluiting Markiezaat ongedaan gemaakt moeten worden.
- Een zoute ontwikkeling van het Markiezaat heeft positief effect op de populatie kustbroedvogels.
- Welke bijdrage het Markiezaat kan leveren aan de landelijke SvI voor de kustbroedvogels is afhankelijk van de keuze of Markiezaat in toekomst verder verzoet of weer zout wordt gemaakt.
- Wat zijn de gevolgen van de keuze voor zout voor de zoetwater- en moerasvogels? Hoe maak je zo'n keuze? Moet je het een dan afwegen tegen het ander vwb de IHDs voor zoetwater- en moerasvogels of kustbroedvogels? Kan het samen? Hoe? Hoe maak je deze keus? Hoe is dit verlopen?
- Functie van het gebied: broeden, foerageren of rusten.

	Minimaal aantal broedparen	**Aantal vogels per seizoen**
Dodaars	30	
Lepelaar	20	50 (seizoen gemiddelde)
Kluut	2.000 (op Deltaniveau)	140 (seizoen gemiddelde)
Bontbekplevier	105 (op Deltaniveau)	360 (seizoen maximum)
Strandplevier	220 (op Deltaniveau)	
Fuut		200 (seizoen gemiddelde)
Geoorde fuut		50 (seizoen gemiddelde)
Aalscholver		680 (seizoen maximum)
Kleine zwaan		30 (seizoen gemiddelde)
Grauwe gans		510 (seizoen gemiddelde)
Brandgans		130 (seizoen gemiddelde)
Bergeend		250 (seizoen gemiddelde)
Smient		1.600 (seizoen gemiddelde)
Krakeend		280 (seizoen gemiddelde)
Wintertaling		700 (seizoen gemiddelde)
Pijlstaart		480 (seizoen maximum)
Slobeend		150 (seizoen gemiddelde)
Meerkoet		920 (seizoen gemiddelde)
Zilverplevier		1.300 (seizoen maximum)
Kanoet		1.600 (seizoen maximum)
Bonte strandloper		6.400 (seizoen maximum)
Zwarte ruiter		210 (seizoen maximum)

1.3.1 Trends aantallen aangewezen vogelsoorten

- Kust- en wadvogels: duidelijke afname waarneembaar.
- Watervogels:
    - Dodaars: stabilisatie van het aantal broedparen
    - Lepelaars: sterke toename
    - Fuut: aanvankelijk goed (door eutrofiëring), sinds 2000 afnemend (slecht doorzicht)
    - Geoorde fuut: onregelmatige trend.
    - Slobeend, bergeend: 2004 – 2008 voor het eerste afnemende trend. Verwachte oorzaak: afname ondiep areaal door nieuwe peil van 0,4 m +NAP.
    - Kleine zwaan, grauwe gans, brandgans: in aantallen toegenomen. Waarschijnlijk geen invloed nieuwe peilbeheer.
    - Krakeend: neemt (overal in Brabant) toe. Lijkt te stabiliseren.
    - In 2010 leek er bij de stand van sommige watervogels enige stabilisatie of zelfs verbetering te zien. In 2012 is de meerconditie (mn het doorzicht) echter zo verslechterd dat het een sterk negatieve invloed lijkt te hebben op veel watervogels.

De situatie is op dit moment (april 2014) zo slecht dat overleg over mogelijke maatregelen tussen de betrokken partijen dringend gewenst is. Omdat het Markiezaatsmeer nu en in de komende jaren instabiel is als gevolg van onder meer de ontzilting en het vrijkomen van fosfaten uit de bodem, is het, zonder het treffen van ingrijpende maatregelen, onvermijdelijk dat de bestaande troebele, voedselrijke situatie in het Markiezaatsmeer decennia blijft bestaan.
Wat is/wordt hiermee gedaan? Is de oorzaak bekend? (→ ontzilting en het vrijkomen van fosfaten uit de bodem?) Over welke maatregelen wordt gedacht?

Broedvogels		
	Niet alle soorten met een IHD kunnen zich op den duur met de beoogde aantallen handhaven.	Geldt in huidige situatie vooral voor soorten die afhankelijk zijn van een brak tot zout milieu met getijde.
	Beheerplan richt zich gedurende de 1e planperiode op behoud van omvang en kwaliteit van een verzoetend Markiezaat, met eilanden en oevers als leefgebied voor deze soorten.	
Strandplevier *Bontbekplevier* *Kluut*	IHD voor gehele Deltagebied (regiodoelstelling).	Bijdrage van het gebied aan de populaties is sterk afgenomen.
Niet-broedvogels		
	Vooral van belang: oevervariatie, water met voldoende voedsel en rust.	Voor behoud van de geschiktheid van het gebied als slaap- en/of foerageergebied.
	Gestreefd naar water met voldoende voedsel en op de lange termijn voldoende doorzicht (= rijk aan waterplanten en vis).	Afname algen als gevolg, kan tot afname leiden van vogelsoorten die alleen algen eten.
Zwanen *Futen*		Voor vogelsoorten die afhankelijk zijn van waterplanten (Zwanen) en doorzicht (fuut) is de kans daarom klein dat de huidige aantallen zullen toenemen. AFNEMEN??
	De rust en het peilregime blijven gehandhaafd om het gebruik va het Markiezaat voor deze vogels als hoogwatervluchtplaats in stand te houden.	De genoemde seizoensmaxima of –gemiddelden in het aanwijzings-besluit zijn vooral afhankelijk van ontwikkelingen in het foerageer-gebied in het hele Deltagebied en kunnen daarom slechts beperkt door beheer of maatregelen in het gebied zelf worden bereikt.
Ecologische vereisten en sleutelprocessen		
Landschap	Veel vogelsoorten afhankelijk van uitgestrekt water met grillige oevers en stukken moeras.	
	Deel van de vogels met IHDs afhankelijk va pionierssituatie.	Gehele delta biedt hiervoor ruimte en voedsel.
	Ondersteunende functie voor als vogelgebied vanwege de grote mate van rust en de broedgelegenheid op drooggevallen oevers.	
Water	Water- en moerasvogels hebben behoefte aan groot waterareaal rijk aan voedsel.	Helder, voedselrijk meer met veel ondiepe zones biedt goede voedselcondities.
	Gevarieerd peil is belangrijk voor de watervogels. ’s Winters hoger dan in de zomer (droogvallen stukken land).	Bij voorkeur grillige oevers en eilanden die in de winter permanent geïsoleerd zijn of (deels) overstromen en in de zomer droogvallen.
	Ook water-kwalitatieve condities zijn belangrijk:	Zonder ingrijpende maatregelen zal in het geval van verdere verzoeting blijvend sprake zijn van een risico op (blauw)algen. (Hoge P-voorraad in waterbodem.)

1.4 Kansen en knelpunten

Belangrijkste factoren van belang voor de trends in aantallen van de aangewezen vogelsoorten:

- Successie van de vegetatie: Om de oevers geschikt te houden als broedplaats (weinig begroeiing) is begrazing in combinatie met peilbeheer (zodat grazers kreken over zullen blijven steken) nodig.
- Eerder of later droogvallen van de oeverzones, afhankelijk van neerslagoverschot en dimensies van de stuw.
- Afnemende zoutgraad heeft gevolgen voor de voedselvoorziening van de aanwezige vogelsoorten. Voor sommigen positief, voor anderen negatief.
- Fluctuatie in waterkwaliteit: effecten op vogelstand onzeker.
- Buiten het N2000-gebied:
    - Knelpunten: verdwijnen van kwelders en schorren neg. effect op kustvogels.
    - Kansen: creëren van strandmilieus in nieuw te graven kreken en andere waterpartijen

1.5 Maatregelen

Gezien de huidige onzekere situatie en de in de toekomst te maken keuze voor verdere verzoeting of een teruggang naar een zilt milieu, zijn er twee typen maatregelen te onderscheiden:

- Geen-spijtmaatregelen voor het behalen van Natura 2000-doelen.
- Maatregelen op basis van toekomstige keuzes.

Brabants Landschap is belangrijkste beheerder. In de eerste planperiode wordt ingezet op voortzetting van het beheer zoals opgenomen in het beheerplan van het Brabants Landschap van 2004 voor het Markiezaat. Het begrazingsbeheer en het peilbeheer (met aftopping op het niveau van NAP + 40 cm) zijn daarin de hoofdpunten. Het Markiezaat ontwikkelt zich daardoor verder in de richting van een grotendeels geïsoleerd zoetwatersysteem met een natuurlijk fluctuerend waterpeil.

Tabel X: Samenvatting van mogelijke fysieke maatregelen

Categorie	**Maatregel**	**Inhoud**	**Opmerking**
Geen-spijt maatregelen	Begrazingsbeheer	Gestuurde begrazing	
	Peilbeheer	Vergroten overlaatcapaciteit	Voordelen: eerder droogvallen = vroegere beschikbaarheid van geschikte gebieden Nadelen: deel van het gebied niet langer beschermd tegen roofdieren.
Maatregelen t.b.v. zoet scenario	Opspuiten van (nieuwe) eilandjes		
	Baggeren + opbrengen schone zandlaag		Niet zinvol voor kustvogels
	Wegvangen van vis	Brasem afvangen ivm woeling en opeten van zoöplankton (dat algengroei door grazing vermindert)	
Maatregelen t.b.v. zout scenario	Verbinding met Oosterschelde herstellen en peilfluctuaties herstellen		Maatregel om te komen tot herstel van het zoute milieu.

1.5.1 Geen-spijt maatregelen: begrazingsbeheer en peilbeheer

Geen-spijtmaatregelen voor het behalen van Natura 2000-doelen hebben onafhankelijk van de latere keuze in een zoet of zout scenario een positief effect. Het betreft de volgende maatregelen:

- **Begrazingsbeheer**
  - Gestuurde begrazing
    - Handhaven van de compartimentering;
    - Indien mogelijk een lichte vergroting van de veedichtheid in de zomer;
    - Eerdere inscharing van runderen in het zomerhalfjaar, ivm vervroeging groei-seizoen);
    - Begrazing met paarden in de winter.
- **Peilbeheer**
  - Vergroten overlaatcapaciteit
    - Voordelen: eerder droogvallen = vroegere beschikbaarheid van geschikte gebieden
    - Nadelen: dat deel van het gebied niet langer beschermd tegen roofdieren.

1.5.2 Begrazingsbeheer

De belangrijkste maatregel is een aanpassing van het bestaande begrazingsbeheer gericht op het kort houden van de grazige vegetatie in het oostelijk deel, waardoor een voldoende groot broed-, rust-, foerageergebied beschikbaar blijft voor de water- en kustvogels met en zonder een IHD. Compartimentering met beweide en onbeweide delen om een gevarieerd landschap te ontwikkelen. Met veehouders contracten over de inscharing van vee, 15 april – 15 november. Oostelijke schor: IJslandse pony's jaarrond.

De voorgenomen acties voor de begrazing in het beheerplan van het Brabants Landschap zijn:

- opheffing van het raster tussen deelgebied 1+2 en 3,
- tijdelijke raster tussen deelgebied 3 en 4 tijdens het zomerhalfjaar op een nieuwe grens,
- jaarrond begrazing met 20 tot 25 IJslanders en tenminste 30 tot 50 runderen,
- deelgebied 4 heeft een zomerbezetting van IJslanders en 50 volwassen runderen; daarnaast circa 25 runderen in deelgebied 3.

1.52 Peilbeheer

Er is in 2004 al een peilverlaging in de zomerperiode toegepast om het areaal aan onbegroeid slik en zandbank te vergroten. Deze maatregel leek geen positief effect te hebben, maar nadat vanaf 2008 in mei het streefpeil van 40 cm +NAP niet werd overschreden is het aantal broedgevallen van kustvogels met een IHD weer voorzichtig toegenomen. Het nut van verdere verlaging van het waterpeil is twijfelachtig voor de kustvogels en gaat gepaard met verdroging door verschuiving van de waterlijn. Daarbij zijn de effecten hiervan op de waterkwaliteit onzeker. Andere mogelijke maatregelen voor kustvogels worden verderop in dit hoofdstuk besproken.

1.5.3 Maatregelen o.b.v. toekomstige keuzes

Deze maatregelen hebben alleen een duurzaam gunstig effect op de IHDs bij één van de gekozen scenario's zoet of zout. De maatregelen die hierna aan de orde komen zijn overigens niet allemaal uit te voeren in de komende beheerperiode. Het betreft de volgende maatregelen:

- Opspuiten van (nieuwe) eilandje(s)
  - Kunnen als broed- of foerageergebied dienen voor kustvogels met een IHD.
  - Niet-kosteneffectief en niet-duurzaam zo lang er onzekerheid is over een zout scenario. → **daarom nog geen maatregel in dit beheerplan**.
- Baggeren en opbrengen schone zandlaag op waterbodem om doorzicht te verbeteren en fosfaatgehaltes te laten dalen.
  - Fosfaat blijkt in diepere lagen te zitten. Baggeren minder zinvol.
  - Afname kustvogelsoorten niet te wijten aan eutrofiëring (als gevolg van overmaat fosfaat).
  - Zou wel positief kunnen uitpakken voor vogelsoorten die behoefte hebben aan een evenwichtiger, waterplantenrijk oppervlaktewater met een diverse visstand.
  - **Voor nu: afgezien van deze maatregel in dit beheerplan**. Toekomst zoet? Dan heroverwegen.
- Wegvangen van vis
  - Brasem kan gaan domineren
    → vermindering doorzicht door woeling
    → eten het zoöplankton dat algengroei door grazen vermindert (eutrofiëring als gevolg van grazing??)
    → **Niet zinvol zo lang fosfaat blijft vrijkomen uit de waterbodem.**
    Heroverwegen als wordt gekozen voor een zout milieu.

2. Brabantse Wal

2.1 Processen

Gedeputeerde Staten van Noord-Brabant zijn verantwoordelijk voor het opstellen van het beheerplan Brabantse Wal. **De totstandkoming van het plan heeft plaatsgevonden in overleg met de betrokken gemeenten, waterschappen, terreinbeheerders (Natuurmonumenten, Staatsbosbeheer, Brabants Landschap, Defensie), particuliere eigenaren en belangengroepen**. Gedeputeerde Staten van Noord-Brabant hebben het beheerplan vastgesteld.
HOE HEEFT DIT PROCES ERUIT GEZIEN?

Voor dit Natura 2000-beheerplan zijn **meerdere overheden bevoegd gezag**; de provincie Noord-Brabant, het ministerie van Landbouw, Natuur en Voedselkwaliteit, het ministerie van Infrastructuur en Waterstaat en het ministerie van Defensie. Dit heeft te maken met de **eigendomssituatie** in het gebied. **Rijkswaterstaat** en het **Rijksvastgoedbedrijf** zijn betrokken geweest bij de totstandkoming van dit beheerplan. De bevoegd gezagen stellen gezamenlijk het beheerplan vast.

Het gebied heeft veel verschillende eigenaren, te weten **Staatsbosbeheer**, **Natuurmonumenten**, **Brabants Landschap**, **Defensie**, **drinkwaterbedrijf Evides**, **gemeente Woensdrecht**, **gemeente Bergen op Zoo**m en **veel particulieren eigenaren**. Landgoed De Groote Meer waar de De Groote Meer (instandhoudingsdoelstelling 'zwakgebufferde vennen') ligt is particulier eigendom. **De familie Cogels** is eigenaar. Het zuidelijk deel van de Brabantse Wal is onderdeel van het grensoverschrijdend natuurgebied Grenspark De Zoom - Kalmthoutse Heide. Het **Vlaamse deel valt onder het Natura 2000-gebied Kalmthoutse Heide**.

Het Grenspark De Zoom - Kalmthoutse Heide is op initiatief van de Benelux Economische Unie opgericht als eerste **grensoverschrijdend natuurpark**. Het **Habitatrichtlijngebied** valt grotendeels onder het Grenspark samen met het aansluitende Vlaamse deel (Kalmthoutse heide). De Nederlandse terreinbeheerders en gebruikers (Staatsbosbeheer, Natuurmonumenten, Defensie, particuliere eigenaren) en de Vlaamse beheerders en gebruikers van het gebied (bijvoorbeeld Defensie) hebben **gezamenlijk overleg over afstemming van beheer, gebruik, inrichting en monitoring**. In het Beleidsplan Beheer en Inrichting (BIP) zijn de lange- en kortetermijndoelstellingen vastgelegd. Momenteel wordt een nieuw BIP opgesteld. De Natura 2000-instandhoudingsdoelstellingen aan beide zijden van de grens zijn hierbij uitgangspunt voor het BIP. Het Natura 2000-gebied Brabantse Wal grenst aan Natura 2000-gebied Kalmthoutse Heide in Vlaanderen. **Afstemming met partijen uit Vlaanderen over het aansluiten van de doelen van beide beheerplannen is noodzakelijk**, met name voor het behalen van de doelen van De Groote Meer.

Waterschap Brabantse Delta heeft een **integrale gebiedsvisie (IGA)** Brabantse Wal en Noordpolder van Ossendrecht opgesteld (Grontmij, 2008). De visie is **niet officieel vastgesteld**, maar de geplande uitvoering van de maatregelen is wel uitgangspunt voor het beheerplan. WAAROM NIET?

Sense of urgency-status
Veel van de habitats in het Natura 2000-gebied Brabantse Wal zijn gevoelig voor hydrologische invloeden. Aan de Brabantse Wal is een s**ense of urgency-status toegekend** voor de wateropgave ten aanzien van het herstel en behoud van het habitattype 'zwakgebufferde vennen' (De Groote Meer). Dit houdt in dat de watercondities (verdroging en waterkwaliteit) op korte termijn moeten verbeteren, anders verandert de situatie onherstelbaar en verdwijnt het habitattype 'zwakgebufferde vennen' permanent. Eind 2009 is een tweetal convenanten afgesloten om het tij te keren. Op 11 juli 2014 is er een derde convenant getekend. HOE GAAT HET HIERMEE?

2.2 Huidige activiteiten en bestaand gebruik

- Natuur- en bosbeheer: Veel verschillende eigenaren, dus ook vele manieren van beheer.
- Recreatie: hoofdzakelijk wandelen en fietsen, incl. horeca.
- Jacht, wildbeheer en schadebestrijding.
- Infrastructuur:
    - Wegen: lokale wegen, N-wegen, A-weg
    - Buisleidingenstraat: regelmatige inspectie
- Agrarisch gebruik: rondom en plaatselijk ook in het N2000-gebied
- Waterbeheer
- Defensie en politie: vliegbasis, oefenterreinen, politieacademie
- Diverse bebouwing: losse woningen en landgoederen
- Industrie en energie

2.3 Instandhoudingsdoelstellingen

Doelen voor:

- Habitattypen (6)
- Habitatsoorten (2)
- Vogelrichtlijnsoorten (6)

In de eerste beheerplanperiode is de prioriteit het tegengaan van verslechtering voor aangewezen soorten en habitattypen waarvoor de gunstige staat van instandhouding nog niet is bereikt.

Tabel 2 . Instandhoudingsdoelstellingen Brabantse Wal (EZ, 25 april 2013)

Code	Nederlandse naam	Doelstelling		
		Oppervlak/omvang Leefgebied	Kwaliteit (leefgebied)	Populatie
Habitattypen				
H2310	Stuifzandheiden met struikheide	Uitbreiding	Verbetering	N.v.t.
H2330	Zandverstuivingen	Uitbreiding	Verbetering	N.v.t.
H3130	Zwak gebufferde vennen	Uitbreiding	Verbetering	N.v.t.
H3160	Zure vennen	Behoud	Verbetering	N.v.t.
H4010A	Vochtige heiden	Uitbreiding	Verbetering	N.v.t.
H4030	Droge heiden	Uitbreiding	Verbetering	N.v.t.
Habitatrichtlijnsoorten				
H1166	Kamsalamander	Uitbreiding	Verbetering	Uitbreiding
H1831	Drijvende waterweegbree	Uitbreiding	Verbetering	Uitbreiding
Vogelrichtlijnsoorten				
A004	Dodaars	Behoud	Verbetering	40 paar
A008	Geoorde fuut	Behoud*	Verbetering	40 paar
A072	Wespendief	Behoud	Behoud	13 paar
A224	Nachtzwaluw	Behoud	Behoud	80 paar
A236	Zwarte specht	Behoud	Behoud	40 paar
A246	Boomleeuwerik	Behoud	Behoud	100 paar

* Enige achteruitgang in draagkracht van het leefgebied ten gunste van het habitattype ‘zwakgebufferde vennen’ (H3130) is toegestaan .

2.3.1 Trends

Tabel 3 . Oppervlak en trend

Habitattype	Huidige situatie		Trend	
	Oppervlakte (ha)	Kwaliteit	Oppervlakte /populatie	Kwaliteit
H2310 Stuifzandheiden met struikhei	73,62	Goed	+	+/-
H2330 Zandverstuivingen	7,52	Nog niet optimaal	-	+/-
H3130 Zwakgebufferde vennen	12,70	Nog niet optimaal	-	-
H3160 Zure vennen	4,05	Matig	0	+/-
H4010A Vochtige heide	18,03	Goed tot vergrast	+/-	+
H4030 Droge heiden	12,90	Goed	0	+/-
H1166 Kamsalamander		Nog niet optimaal	0	0
H1831 Drijvende waterweegbree		Nog niet optimaal	0/+	0
A004 Dodaars		Matig	0/-	0/-
A007 Geoorde fuut		Matig	0/-	0/-
A072 Wespendief		Onbekend	?	?
A224 Nachtzwaluw		Gunstig	+	0
A236 Zwarte specht		Ongunstig	0/-	-?
A246 Boomleeuwerik		Gunstig	0/-	0

2.3.2 Ecologische vereisten

- Voedselarme bodem en water
- Rust
- Sleutelprocessen:
    - Stagnatie van water
    - Podzolering
    - Verstuiving
    - Verbossing

2.3.3 Kansen en knelpunten

Kansen:

- Verdere aanpak verdroging en hydrologische herstelmaatregelen

Knelpunten:

- **Vermesting en verzuring**
- **Verdroging**
    - Grondwateronttrekking tbv drinkwater Evides

- 2015: ligt nieuw beheerplan klaar. Nora van den Berg zienswijze ingediend, evenals 7 natuur- en milieuverenigingen en West-Br. → onvoldoende en verkeerde maatregelen tegen verdroging. JOOP BOUMA. (31 december 2015 donderdag). Zwemmen kan hier niet meer. *Trouw.*

- Verbossing
- Verdringing
- Versnippering
- Verstoring
- 17-04-2020: Illegale cross met terreinwagens en motoren (Thijmen Alleman. (17 april 2020 vrijdag). Weer verstoort een groep crossers een rustgebied op de Brabantse Wal: 'Asociale knurften'. *AD/Algemeen Dagblad.nl.)*

2.4 Maatregelen

Tabel 9. Overzicht maatregelen eerste beheerplanperiode.

maatregel nr	**Brabantse Wal**	Omschrijving maatregel	Toelichting	Stuifzandheiden met struikheide	Zandverstuivingen	Zwak gebufferde vennen	Zure vennen	Vochtige heiden	Droge heiden	Kamsalamander	Drijvende Waterweegbree	Dodaars	Geoorde fuut	Wespendief	Nachtzwaluw	Zwarte Specht	Boomleeuwerik	Trekker	PAS maatregel	onderdeel convenant
	Hydrologisch herstel																			
1	*uitbreiding en verbetering kwaliteit vochtige heiden*	Begrazing Kortenhoeff afstemmen op kritische soorten	Drukbegrazing					X										Staatsbosbeheer	X	
2		Anti-verdrogingsmaatregelen	Hydrologische maatregelen tbv De Groote Meer					X										Cogels		X
3	*uitbreiding zandverstuivingen, stuifzandheid met struikheide, droge heide, ecol verbindingen open heide en stuifzand incl. herstelstrategie*	Open verbinding creëren Steertse Heide met De Groote Meer	Onderdeel LIFE + aanvraag (besluit dec 2018)	X	X	X									X		X	Grenspark	X	X
4	*Uitbreiding oppervlak en verbetering kwaliteit zwakgebufferde waterweegbree, dodaars geoorde fuut en kamsalamander*	Inrichting aanpassen / herstel watersysteem zodat ontwatering verminderd en toestroom water naar De	Dempen greppels, afwatering weg kortenhoeff en Putseweg uitgevoerd onder project Jagersrust			X	X			X		X	X					Waterschap Brabantse Delta		X
5			Opstellen stappenplan Steerste Heide & Groote Meer duurzaam herstel van aanvoer van voldoende water met de gewenste kwaliteit (o.a. Life+ financiering), incl. opschonen Groote Meer			X	X	X		X	X	X	X					Grenspark		X
6			Herstel lokale watersysteem gericht op maximale toestroom water naar de Groote Meer en minimale ontwatering			X	X			X		X	X					Natuurmonumenten Cogels ABN		X
7			Dempen watergang Kleine Meer			X	X			X		X	X					Natuurmonumenten		X
8			Aanleg ven tegen Kleine Meer aan In uitvoering onderdeel (JR)			X	X			X		X	X					Waterschap Brabantse Delta		
9			(Tijdelijke) aanvoer overschot water Kalmthoutse heide naar De Grootte Meer			X	X			X		X	X					Evides		X
10			Vermindering drainerende werking en beekherstel Heiloop, verondieping of aanleg drempels (in uitvoering / deelsuitgevoerd onder project JR)			X				X	X	X	X					Waterschap Brabantse Delta		X
11		Onderzoek	Bodemsamenstelling Groote Meer tbv verbeteren waterkwaliteit opp. aanvoer water			X	X	X		X	X	X	X					Waterschap Brabantse Delta		X

12	**Overige vennen**	Venherstel Kleine Meer inclusief onderzoek herstel leemlaag	Opschonen van delen van Klein meer, herstel leemlaag op punten waar deze is doorgraven			X	X	X										Natuurmonumenten	X	X
13		Vrijmaken oevers van boomopslag zwaluwmoer					X					X						Cogels	X	
14		Herstel vennen nabij volksabdij (uitgevoerd)	Boskap en uitgraven 5 vennen				X											Volksabdij	X	
15		Herstel Moseven (uitgevoerd)	Opschonen ven, vrijstellen venoevers				X					X						Evides	X	
16		Aankoop en inrichtingsplan Jagersrust	Aankoop (gerealiseerd) en Inrichting EHS. Aanleg ven. Aanpassen afwateringsstructuur, dempen greppels, dempen watergang vanaf Kleine meer tot aan de N289.			X												Waterschap Brabantse Delta, uitvoering DLG	X	
17		Vermindering drainerende werking en beekherstel Heiloop	Verondieping of aanleg drempels			X			X	X								Waterschap Brabantse Delta		X
18		Inrichting Moerven (bij Heiloop)	Inrichting van ven is al in uitvoering			X			X	X								Waterschap Brabantse Delta		X
20		Vrijzetten oevers.	Uitbreiden zure vennen				X											Staatsbosbeheer/Natuurmonumenten	X	
21	***Reductie Grondwateronttrekkingen***	Reductie drinkwaterwinning NL	Reductie waterwinning Evides met 4 miljoen m3 per jaar			X	X	X		X	X	X	X					Evides		X
22	***Herstelstrategie***	Herstel buffercapaciteit door bekalken inzijggebied.	Indien monitoring pH zakt onder de 5			X				X	X							Staatsbosbeheer Natuurmonumenten Cogels	X	X
23		Maaien, plaggen en verwijderen bos.	Beheer in zwakgebufferde vennen (extra maaien water- en oevervegetatie) en vochtige heide			X		X			X							Staatsbosbeheer Natuurmonumenten Cogels	X	X
24		Terugdringen bosontwikkeling in Groote Meer	Verwijderen bos					X										Cogels	X	X
25		Opslag verwijderen Kortenhoeff	Verwijderen bos					X										Staatsbosbeheer Natuurmonumenten	X	X
26		Herstelmaatregelen stuifzanden en stuifzandheide in VR-gebied	Verwijderen opslag H2310. Plaggen, zeven, frezen, eggen en verwijderen opslag/kappen bos H2330	X	X									X		X		BL	X	
27			plaggen ivm uitbreiding door boskap		X													Staatsbosbeheer Natuurmonumenten Cogels, Grenspark	X	
28			Verwijderen opslag		X				X									Staatsbosbeheer Natuurmonumenten Grenspark	X	
29			Drukbegrazing		X				X									Staatsbosbeheer Natuurmonumenten	X	
30		Kappen bos	Kappen bos uitbreiding Kriekelaersduinen		X													Staatsbosbeheer	X	
31		Branden	fall backoptie		X													Staatsbosbeheer Natuurmonumenten	X	
32		Verstuiving op gang houden.			X													Staatsbosbeheer Natuurmonumenten Cogels	X	
33		Verwijderen bos.			X				X									Staatsbosbeheer Natuurmonumenten Cogels	X	X
34		Extra plaggen of chopperen.	afh van noodzaak en monitoring	X	X		X											Staatsbosbeheer Natuurmonumenten Cogels	X	
35		Extra maaien/begrazen	fall backoptie	X	X										X			Staatsbosbeheer Natuurmonumenten Cogels	X	
36		Behoud en rust in en rond vennen	Recreatiezonering en toezicht										X					Grenspark		
37	***instandhouding van vogels***	Zonering bosbeheer	Opstellen handvest bosbeheer/exploitatie voor particuliere boseigenaren Brabantse Wal.															Grenspark		
38			Zonering bosbeheer in bosbeheerbeleid beheerders											X	X	X	X	Terreinbeheerder en particuliere eigenaren		
39		Onderzoek	Onderzoek naar effecten van stikstofdepositie en verbetering kwaliteit bestaande leefgebied													X		Provincie Noord-Brabant		
40		Recreatiezonering	Recreatiezonering en toegangspoorten	X	X								X	X	X	X	X	Grenspark		
41		Randbeheer promoten bij Koude Heide															X	Provincie Noord-Brabant		
43	monitoring sense of urgency opgave	Extra monitoringsopgave sense of urgency				X		X		X	X	X	X					Provincie Noord-Brabant		

2.5 Communicatie

	Project/deeltaak Ihkv Natura 2000	**Middel**	**Doelgroep**	**Huidige en geplande communicatieactiviteiten**	**Wat zijn de aanvul-lende wensen?**	**Afspraken**
Provincie Noord-Brabant	Communicatie over de Provinciale beheerplannen	Website Folders Inzet communicatieadviseur	Gebruikers & omwonenden, vergunningaanvragers.	Website Folders Aansluiten bij bestaande communicatiemiddelen		
Gemeente Woensdrecht		Via BO en Platform de Brabantse Wal afstemming en monitoren van gemaakte afspraken				
Gemeente Bergen op Zoom		Via BO en Platform de Brabantse Wal afstemming en monitoren van gemaakte afspraken				
Gemeente Roosendaal		Via BO en Platform de Brabantse Wal afstemming en monitoren van gemaakte afspraken				
Gebieds-commissie Brabantse Delta		Nieuwsbrief Brabantse Delta				
Waterschap Brabantse Delta	Communicatie over projecten en activiteiten van het waterschap Link tussen watercondities Natura 2000 en KRW doelen helder voor het voetlicht brengen.	Middel: website, nieuwsbrieven, infoavonden, opening en opleveringsbijeenkomsten Factsheet (levend document) Website Bijdragen aan activiteiten onder	Doelgroep: gebruikers en om- en inwonenden Overheden, terreinbeheerders, belangenorganisaties, ondernemers, burgers.	Nieuwsbrief, infoavonden, opening en afsluiting (pers) Aansluiten bij bestaande communicatie activiteiten (geen aanvullend budget)		
	Risico's van slechte waterkwaliteit (hoge N en P gehaltes in relatie tot algenbloei) communiceren. Samen met andere partners communiceren over mogelijke oplossingsrichtingen voor toekomstig beheer (zoet en zout)	regie van provincie Voortgangsrapportages KRW en Waterbeheerplan		Aansluiten bij te vormen alliantie vanuit Uitvoeringsprogramma ZW Delta – gebiedsprogramma Bergen op Zoom aan Zee		
Brabants Landschap						
Natuurmonumenten	communicatie over natuurdoelen, recreatieve mogelijkheden, ontwikkelingen en dat steun nodig is (help mee)	website, excursies, infopanelen, presentaties, persberichten	Gebruikers, omwonenden, leden (NM, maar ook brede groene achterban), instanties, belangengroepen en ondernemers	Zie vorige kolom	Specifieke Natura 2000-communicatie (en -middelen), herkenbaar, positieve aspecten benadrukken (TOP-natuur, aanwinst omgeving, kansen, trots)	
Staatsbosbeheer	Communicatie over maatregelen gekoppeld aan Natura 2000-doelen/ *sense of urgency*	Website, maatregelgerelateerde excursies, infopanelen, persberichten	Recreanten, omwonenden, belanghebbenden, achterban e.d.	Op dit moment niet; in toekomst gerelateerd aan de te nemen maatregelen in het kader van Natura 2000 en indien relevant in gezamenlijkheid met andere partijen (zie ook bijlage bij convenant)	Gezamenlijk opgaan, duidelijkheid over te behalen doelen en maatregelen communiceren; werkend vanuit kansen.	
Recreatie						
Wildbeheereenheid	Communicatie over de gebruiksmogelijkheden in het kader van jacht beheer en schadebestrijding	Website, verenigingsblad De Nederlandse Jager, nieuwsbrieven en presentaties	Wildbeheereenheden, individuele jagers en grondgebruikers	Zie kolom middel	Misschien dat een folder ten aanzien van diverse gebruiksfuncties kan worden opgesteld. (Waaronder de mogelijkheden ten aanzien van Jacht, beheer en schadebestrijding)	
IVN	Natuurwaarden van het gebied	Nieuwsbrief, excursies	Leden en donateurs, gebruikers	Onderdeel van reguliere activiteiten	Voortzetten grote evenementen als Brabantse Waldag, week van het landschap, etc.	
BMF	Communicatie Input in proces gelet op Natura 2000 Kortsluiten resultaten Hoe verloopt procedure?	Website BMF Website ave@natura groepenbrief excursies	Achterban leden reconstructie- en gebiedscommissies groene waterschaps-bestuurders leden landinrichtingstrajecten	Websites Uitkomsten onderzoeken kwaliteit beheersplannen en agrarische bedrijfsvoeringaanpassingen (onderzoek LEI,CLM)	Ook in voorlichting publiek aandacht besteden aan andere waarden (geologie, cultuurhistorie, enz.) waarom de N2000-gebieden behouden moeten blijven	
ZLTO			Ondernemers in en rondom het gebied	In het algemeen via Nieuwe Oogst wordt geïnformeerd over Natura i.h.a. actuele zaken, en via de website van ZLTO,	Als er duidelijkheid is over welke activiteiten zijn toegestaan, welke een vergunning eisen en welke voorwaarden, dan graag een heldere brochure/checklist	
Landgoedeigenaren / BPG						

Evides	Voortgang uitvoering maatregelen convenanten	Nieuwsbrief/persberichten i.o. met andere participanten. Voortgangsbericht in eigen bladen	Burgers en bedrijven op m.n. Brabantse Wal, maar ook consumenten daarbuiten. Eigen personeel en andere belanghebbenden			
Brabant Water						
Grenspark de Zoom-Kalmhoutse heide	Communicatie over maatregelen gekoppeld aan Natura 2000-doelen. Zie LIFE-project HeLa.	Website, maatregelgerelateerde excursies, infopanelen, persberichten	Recreanten, omwonenden, belanghebbenden, natuurgidsen, bestuurders, beheerders,…		Samenwerking betreffende communicatie met Natuurmonumenten, Staatsbosbeheer, ANB, Natuurpunt (grensoverschrijdend)	
Defensie	Defensie hecht grote waarde aan draagvlak voor het beheer dat zij uitvoert op haar terreinen. Richting belanghebbenden dient informatie te worden verstrekt over het belang van het gebied, de waarde vanuit internationaal perspectief, de natuurwaarden die aanwezig zijn in het gebied en wat Defensie als beheerder in het gebied wil realiseren. In het kader van de Natura 2000 is het van belang om de instandhoudingsdoelstellingen die voor het gebied gelden, en de daaruit voortkomende instandhoudingsmaatregelen, toe te lichten.	Algemene informatie over natuurbeheer bij Defensie kan men terugvinden in de brochure 'Defensie in natuur en landschap', ' Natuur, aardkunde, cultuurhistorie en recreatie op militaire terreinen' uit 2002. Hierin wordt o.a. de omvang en aard van het ruimtebeslag van de Defensieterreinen beschreven, ingegaan op de (specifieke) natuurwaarden en het gebruik en beheer dat voor Defensieterreinen specifiek is. Voor algemene vragen met betrekking tot de nieuwe natuurbeschermingswet en Natura 2000 kan men terecht op de website: www.minlnv.nl/natuurwetgeving. Vragen m.b.t. Defensie in relatie met Natuur en landschap (Natura 2000) kan men stellen bij het Defensie Voorlichtingscentrum.	Dit geldt zowel richting de (militaire) gebruikers van het terrein als externe partijen zoals bevoegde gezagen, omwonenden en recreatieve gebruikers van het terrein.	Er vindt op dit moment geen specifieke voorlichting plaats over het beheerplangebied		

3. Vlijmens Ven, Moerputten & Bossche Broek

Natura 2000-gebied Vlijmens Ven, Moerputten & Bossche Broek is ruim 900 hectare groot en ligt ten zuidwesten van ’s-Hertogenbosch. De beekdalen van de Dommel, Aa en Broek- en Zandley gaan hier over in het laagveengebied van de ‘Naad van Brabant’. Door de ligging in deze overgangszone zijn in het gebied baseminnende water-, moeras- en graslandvegetaties aanwezig. De graslanden vormen het leefgebied van twee zeer zeldzame vlinders, het pimpernelblauwtje en het donker pimpernelblauwtje. In de sloten en moerassen leven grote en kleine modderkruipers en van kwelwater afhankelijk kranswieren en drijvende waterweegbree. Natuurmonumenten, Staatsbosbeheer en de waterschappen Aa en Maas en De Dommel zijn de belangrijkste beheerders in het gebied.

Het onnatuurlijk waterpeil en de **vermesting op gronden die nog in agrarisch gebruik** zijn leiden tot achteruitgang van de natuurwaarden in het gebied. Ook voor de delen waar het pimpernelblauwtje een kernpopulatie heeft (Bijenwei) is **verbetering van de waterhuishouding noodzakelijk** voor het behoud van de vegetatie waar onder andere deze vlinder van afhankelijk is. In het Vlijmens Ven en Moerputten wordt in de eerste beheerplanperiode met de projecten Hoogwateraanpak ’s-Hertogenbosch (HoWaBo) en het **LIFE+-project** 'Blues in the Marshes' de **abiotische randvoorwaarden gecreëerd** die bijdragen aan het verbeteren van de kwaliteit van de bestaande habitattypen en uitbreiding van de gewenste habitatypen op vele hectare mogelijk maken. Deze habitattypen zijn van groot belang voor de instandhouding van populaties van het pimpernelblauwtje en donker pimpernelblauwtje. Beide vlindersoorten vormen de kern van de instandhoudingsdoelstellingen en zijn tegelijkertijd ook de meest uitdagende opgave.

In totaal wordt in het Vlijmens Ven 620 hectare **landbouwgrond ingericht als Natte Natuurparel**. **Daarmee worden de voornaamste knelpunten in het gebied - verdroging, vermesting en water van onvoldoende kwaliteit - opgelost.**
In de sloten en moerassen in het gebied zijn de instandhoudingsdoelstellingen voor de modderkruipers, kranswieren en drijvende waterweegbree met vrij beperkte ingrepen te realiseren. De nieuw aan te leggen sloten bieden volop kansen voor uitbreiding van deze soorten.
De verwachting is dat vooral in het begin van de tweede beheerplan periode de gewenste uitbreiding van de habitattypen gerealiseerd wordt, omdat de vegetatie dan voldoende tot ontwikkeling is gekomen om zich te kwalificeren. De populatie pimpernelblauwtjes zal meeliften op de uitbreiding van het habitattype en uitbreiding van de populatie is ook mogelijk door herintroductie van deze vlinder in de Bossche Broek. De herintroductie van het donker pimpernelblauwtje kan in gang worden gezet als er voldoende habitat van de juiste kwaliteit aanwezig is in het gebied voor een duurzame populatie.

In de Bossche Broek zijn in 2005 (GGOR Bossche Broek Noord) veel **herstelmaatregelen uitgevoerd** en zijn de meeste **landbouwgronden verworven**. De gewenste **peilverhoging**, belangrijk voor het behalen van de instandhoudingsdoelstellingen, wacht op verwerving van een laatste landbouwperceel en het verhogen van een fietspad en enkele steigers van de zeilvereniging; deze maatregelen staan voor de eerste beheerplan periode gepland.

Het gebied heeft verschillende eigenaren: Natuurmonumenten, Staatsbosbeheer, gemeenten, Waterschap Aa en Maas (Drongelens Kanaal), DLG/Bureau Beheer Landbouwgronden en diverse particulieren. De afgelopen jaren zijn grote delen van de voormalige particuliere gronden verworven voor herinrichting van natuur. De wegbermen vallen onder verantwoordelijkheid van de gemeenten. Het Vlijmens Ven en de Moerputten liggen in het beheersgebied van Waterschap Aa en Maas, het Bossche Broek ligt in het beheersgebied van Waterschap De Dommel.

De provincie Noord-Brabant is verantwoordelijk voor het opstellen van dit beheerplan. Bij de opstelling van Natura 2000-beheerplannen zijn belanghebbende partijen zoals agrariërs, natuurorganisaties, waterschappen, gemeenten, overige terreineigenaren en De Vlinderstichting betrokken. Deze partijen hebben de afgelopen jaren in verschillende gremia hun bijdrage geleverd aan dit beheerplan. Gedeputeerde Staten van Noord-Brabant hebben het beheerplan vastgesteld.

Bevoegde gezagen: de provincie Noord-Brabant, het Ministerie van Economische Zaken en het Ministerie van Infrastructuur & Milieu. Dit heeft te maken met de eigendomssituatie in het gebied. Rijkswaterstaat en Dienst Landelijk Gebied zijn betrokken geweest bij de totstandkoming van dit ontwerpbeheerplan. De bevoegd gezagen stellen gezamenlijk het ontwerpbeheerplan vast.

3.1 Huidige activiteiten

- Natuurbeheer: voornamelijk maaien en afvoeren van de vegetatie in de schraallanden. Inundatie in de Rijskampen. Plaggen ten NW van de Moerputten. Peilbeheer.
- Versnelde aanpassing van het waterbeheer door wegproject A2 (20 ha landbouwgrond naar Natuurmonumenten tbv 60 ha aaneengesloten gebied).
- Recreatie.
- Schadebestrijding (jacht, eendenkooien).
- Infrastructuur; Drongelens kanaal met fietspad, lokale en regionale wegen, A59
- Agrarisch gebruik: enkele percelen in het gebied, diverse percelen om het gebied
- Waterkeringen
- Waterhuishouding: onttrekkingen (BraWa, Heineken), peilbeheer, drainages

3.2 Instandhoudingsdoelstellingen

Tabel 2. Instandhoudingsdoelstellingen Vlijmens Ven, Moerputten en Bossche Broek op basis van het definitieve aanwijzingsbesluit (EZ, 23 mei 2013).

Code Habitattypen	Nederlandse naam	Doelstelling		
		Oppervlak	Kwaliteit (leefgebied)	Populatie
H3140	Kranswierwateren	Uitbreiding	Verbetering	Nvt
H6410	Blauwgraslanden	Uitbreiding	Verbetering	Nvt
H6510A en B	Glanshaver- en vossenstaarthooilanden	Uitbreiding	Verbetering	Nvt
H7140A	Overgangs- en trilveen	Behoud	Behoud	Nvt
Habitatrichtlijnsoorten				
H1059	Pimpernelblauwtje	Uitbreiding	Verbetering	Uitbreiding tot duurzame populatie
H1061	Donker pimpernelblauwtje	Uitbreiding	Verbetering	Uitbreiding tot duurzame populatie
H1145	Grote modderkruiper	Uitbreiding	Verbetering	Uitbreiding
H1149	Kleine modderkruiper	Behoud	Behoud	Behoud
H1831	Drijvende waterweegbree	Behoud	Behoud	Behoud

Op 23 februari 2015 heeft de Staatssecretaris van EZ een ontwerp-wijzigingsbesluit genomen, waarin voor dit Natura 2000-gebied de volgende wijzigingen zijn opgenomen:

- Van H6510 vervalt subtype B (subtype A blijft gehandhaafd)
- H6430A Ruigten en zomen (moerasspirea) wordt toegevoegd.

3.2.1 Trends

Tabel 3. Habitattypen oppervlak en trend

Code	Nederlandse naam	Doel-stelling	Opp. (ha)	Trend	Opmerkingen
H3140	Kranswierwateren	Uitbreiding	0,1+ 2,9 zoek-gebied	Lokaal goed ontwikkeld met een stabiele trend	Afhankelijk van beheer en voorkomen niet op een vaste plek in het gebied
H6410	Blauwgraslanden	Uitbreiding	19,4	Goed tot matig ontwikkeld met lokaal een negatieve trend	Verdroging, vermesting en verzuring veroorzaken lokaal afname van de kwaliteit
H6510A en B	Glanshaver- en vossenstaarthooilanden	Uitbreiding	8	Goed ontwikkeld met een stabiele trend	Bij voortzetting huidig beheer is uitbreiding te verwachten
H7140A	Overgangs- en trilveen	Behoud	22	Goed tot matig ontwikkeld, trend is niet gedocumenteerd maar waarschijnlijk positief	Verdroging, vermesting en verzuring kunnen afname van de kwaliteit veroorzaken

Tabel 4. Habitatsoorten, trend

Code	Nederlandse naam	Trend in gebied	Opmerkingen
H1061	Donker pimpernelblauwtje	Waarschijnlijk uitgestorven met zeker een negatieve trend	Beheer van leefgebied vormt knelpunt samen met vorm van het leefgebied (smalle lijnvormige elementen die zeer gevoelig zijn voor randeffecten)
H1059	Pimpernelblauwtje	Stabiele populatie met een neutrale trend	Kwetsbaar door ontbreken metapopulatie als gevolg van beperkte kwaliteit omliggende graslanden
H1145	Grote modderkruiper	Grote populatie met stabiele trend	Geen knelpunten voor deze soorten te verwachten
H1149	Kleine modderkruiper	Grote populatie met stabiele trend	Geen knelpunten voor deze soorten te verwachten
H1831	Drijvende waterweegbree	Lokaal en incidenteel aanwezig, trend is onbekend	Afhankelijk van beheer en voorkomen niet op een vaste plek. Waarschijnlijk vooral als zaadbank.

Samenvattend zijn dit belangrijkste **ecologische vereisten van de instandhoudingsdoelstellingen** (LNV, 2008):

- Kranswierwateren: basische tot zwak zure, licht voedselrijke tot zeer voedselrijke niet droogvallende wateren. Voor bepaalde soorten is ook de aanwezigheid van kwel van belang.
- Blauwgrasland: neutrale tot matig zure, natte tot zeer vochtige, matig voedselarme tot matig voedselrijke bodems die niet tot incidenteel worden overstroomd met beekwater. Kwel en inundatie dragen bij aan het ‘opladen’ van de buffercapaciteit van de bodem.
- Glanshaverhooiland: basische tot zwak zure, vochtige tot matig droge, matig voedselrijke bodems die incidenteel worden overstroomd.
- Vossenstaarthooiland: neutrale tot zwak zure, zeer natte tot vochtige, matig voedselrijke tot zeer voedselrijke bodems.
- Overgangs- en trilveen: neutrale tot matig zure, ’s winters inunderend tot zeer nat, matig voedselarme tot zeer voedselrijke bodems die liever niet worden overstroomd.
- Pimpernelblauwtje: vrij vochtige, matig schrale tot licht bemeste graslanden met veel grote pimpernel, te karakteriseren als begroeiingen van de verbonden Calthion palustris en Junco-Molinion, en habitattypen H6410 en H6510. In Nederland is de voornaamste waardmier de moerassteekmier. Deze mierensoort maakt zijn nesten vooral op open plaatsen in de vegetatie;
- Donker pimpernelblauwtje: vochtige graslanden met begroeiingen van het dotterbloemverbond, verbond van biezenknoppen en pijpenstrootje en moerasspireaverbond. De waardmier is de gewone steekmier. Deze mier heeft een voorkeur voor licht verruigde vegetaties en matig beschaduwde en vochtige microklimaten.
- Grote modderkruiper: ondiep, stilstaand of zeer langzaam stromend water met een dikke modderlaag op de bodem en een rijke begroeiing. Van nature komt deze soort voor in vergevorderde verlandingsstadia van grote en kleine wateren.
- Kleine modderkruiper: stilstaande en langzaam stromende wateren vormen ideale biotopen. De kleine modderkruiper heeft een grotere voorkeur voor harde en zandige bodems dan de grote modderkruiper.
- Drijvende waterweegbree: stilstaande of zwak stromende, heldere voedselarme tot matig voedselrijke, fosfaat- en kalkarme, maar ijzerrijke wateren. In een voedselrijkere omgeving staat de soort het meest op plaatsen waar regenwater zich mengt met kwelwater. In specifieke omstandigheden, namelijk bij een lage beschikbaarheid van fosfaat, komt de drijvende waterweegbree ook in nitraat- en ammoniakrijk water voor.

3.2.2 Kansen en knelpunten

Verdroging, vermesting en verzuring:

- Loskoppelen landbouwkundig peilbeheer tbv de natuur.
- Afname noodzakelijke stikstofdepositie door voorgenomen beleid over emissies van verzurende en vermestende stoffen.
- Schonen van waterbodems tbv de ontwikkeling van de uiterst zeldzame en kwetsbare onderwatervegetatie (drijvende waterweegbree en kranswierwateren)

3.3 Maatregelen

Om de geconstateerde knelpunten te kunnen oplossen zijn met name op het gebied van waterbeheer maatregelen gewenst. Op het gebied van vermesting is een afname van de stikstofdepositie nodig.

Tabel 9: Overzicht maatregelen eerste beheerplanperiode.

maatregel nr	Vlijmens Ven	Omschrijving maatregel	H3140 Kranswierwateren	H6410 Blauwgraslanden	H6510A Glanshaver- en vossenstaarthooilanden (glanshaver)	H7140A Overgangs- en trilvenen (trilvenen)	H1059 Pimpernelblauwtje	H1061 Donker Pimpernelblauwtje	H1145 Grote modderkruiper	H1149 Kleine modderkruiper	H1831 Drijvende waterweegbree	trekker	PAS maatregel
	Bossche broek												
1		Uitvoeren herinrichtingsplan (inrichting percelen, waterlopen, fietspad en steigers)		X	X	X	X		X	X	X	Staatsbosbeheer	X
2		Onderhoudsbeheer		X	X	X			X	X		Staatsbosbeheer	X
3		Aanpassen peilbeheer (GGOR),		X	X	X	X		X	X	X	Waterschap De Dommel	X
4	*Vlijmens ven*	Uitvoeren herinrichtingsplan GGOR, herinrichten gronden	X	X	X		X	X	X	X	X	Natuurmonumenten en Waterschap Aa en Maas	X
5		Ontwikkelen habitattypen door beheer	X	X	X		X	X	X	X	X	Natuurmonumenten, Staatsbosbeheer	X
6		Aanpassen peilbeheer, onderhoudsbeheer watergangen en dijken	X	X	X		X	X	X	X	X	Waterschap Aa en Maas	X
8	*herstelstrategie*	Verwijderen organische sedimenten	X						X	X	X	Natuurmonumenten, Ws Aa en Maas	X
9		Maaien + opstellen onderhoudsplan maaibeheer (onderhoud)	X	X		X	X	X			X	Natuurmonumenten, Staatsbosbeheer, waterschap Aa en Maas	X
10		Herstel buffercapaciteit door bekalken inzijggebied		X	X							Natuurmonumenten, Staatsbosbeheer	X
11		Herstel buffercapaciteit door gedoseerde inlaat van gebufferd water	X	X	X							Waterschap Aa en Maas	X
12		Inundatie (fall back optie)		X								Staatsbosbeheer	X
13		Ondiep begreppelen (fall back optie)		X								Staatsbosbeheer	X
14		Bekalken		X								Natuurmonumenten, Staatsbosbeheer	X
15		Plaggen		X								Natuurmonumenten, Staatsbosbeheer	X
16		Kleinschalig plaggen (fall back optie)		X								Staatsbosbeheer	X
17		Extra hooien of nabeweiden (beheer)			X							Natuurmonumenten, Staatsbosbeheer	X
18		Verbeteren kwaliteit oppervlaktewater (al uitgevoerd)	X	X		X			X	X		Staatsbosbeheer, waterschap Dommel	X
19		Opslag verwijderen		X	X	X	X	X				Natuurmonumenten, Staatsbosbeheer	X
20		Extra maaien water- en oeverbegroeing	X								X	Staatsbosbeheer, natuurmonumenten, waterschap Aa en Maas en De Dommel	X

Een belangrijk voorwaarde voor realisatie van de Natura 2000-doelen en bovenstaande maatregelen is het verwerven - en mogelijk inrichten - van benodigde gronden binnen het NNB.

3.4 Communicatie

Schematisch overzicht van de communicatieve activiteiten over het Natura 2000-gebied Vlijmens Ven, Moerputten & Bossche Broek.

Instantie	Project/deeltaak Ihkv Natura2000	Middel	Doelgroep	Huidige en geplande communicatieactiviteiten	Wat zijn de aanvullende wensen?	Afspraken
Provincie Noord-Brabant	Communicatie over de Provinciale beheerplannen	Nieuwsbrief Website Folders Informatieavond communicatieadviseur	Gebruikers & omwonenden, vergunningaanvragers.	Algemene nieuwsbrief Website (wordt geactualiseerd) Folders Informatieavond(en)	Afstemming met ministerie en overige partijen In beeld brengen communicatienoodzaak (zakelijk, bewoners, recreatief, etc)	
Gemeente Heusden	Permanent basisinfo beschikbaar voor publiek					
Gemeente 's-Hertogenbosch	Permanent basisinfo beschikbaar voor publiek					
Gemeente Vught	Permanent basisinfo beschikbaar voor publiek					
Reconstructie-/gebiedscommissie	Gebiedscie. Wijde Biesb.: communicatie/afstemming	Nieuwsbrief Website Folders	Leden gebiedscie. En ambtelijke adv.groep plus hun achterbannen	Nader te bespreken; Website en Nieuwsbrief juni??		
Waterschap De Dommel						
Waterschap Aa en Maas	Inrichting Natte Natuurparel / HoWaBo	Informatiekeet communicatieadviseur	Omwonenden, passanten	Informatiekeet	Afstemming met overige partijen – keet delen	
Brabant Water						
Heineken	Ziet geen specifieke taak					
Terreinbeheerder Staatsbosbeheer	Informeert publiek over Bossche Broek					
Terreinbeheerder Natuurmonumenten	Communicatie over eigen terreinen	Website per gebied Folders Informatieborden Tijdschriften Excursies	Beleidsmakers, leden, geinteresseerden	Nieuwe folder en borden+ logo Natura2000 "Van Nature" voor beleidsmakers en "Natuurbehoud" voor algemeen publiek. Niet specifiek voor dit gebied		
Particuliere terreinbeheerder?						
Vlinderstichting	Doelsoorten	Publicaties, cursussen	Beleidsmakers, opdrachtgevers, geinteresseerden, scholen, beheerders	Monitoringrapport (1/jaar) Actieplan Pimpernelblauwtjes	Voortzetten financiering activiteiten	
				Folders Cursussen		
Vogelwerkgroep						
Natuurbeschermings-organisatie/Cultuurhistorie Groene Vesting?						
Recreatie?						
ZLTO	Relatie tot belang agrariërs	Bijeenkomsten, publicaties, advisering	Leden, beleidsmakers, politiek	Bijeenkomsten, adviezen	Richt communicatie op specifieke doelgroepen	
Omwonenden?						

4. Ulvenhoutse Bos

Update 2020: ,,Direct bij de installatie van het nieuwe college van Gedeputeerde Staten zijn vraagtekens geplaatst bij het instandhouden van Natura-2000 gebieden", wijst ze op de verklaring dat het college 'wil verkennen of aanpassing van de Natura 2000-gebieden uitvoerbaar is'.

➔ Online petitie om het Ulvenhoutse Bos haar status als N2000 gebied te laten behouden. Wat rol kan spelen is dat de A58 verbreed gaat worden (ligt in gebied).

Palko Peeters. (10 juni 2020 woensdag). Petitie behoud Ulvenhoutse Bos gaat als een speer: al ruim 4200 handtekeningen. *AD/Algemeen Dagblad.nl.* Retrieved from https://advance-lexis-com.ezproxy.elib10.ub.unimaas.nl/api/document?collection=news&id=urn:contentItem:603M-F7T1-JBHV-K3CK-00000-00&context=1516831.

Het Ulvenhoutse Bos is een klein bosgebied in de gemeente Breda bij het dorp Ulvenhout. Het is één van de oudste bossen in Nederland. Binnen Nederland is dit bos één van de natuurparels.

4.1 Doelen

De belangrijkste opgave voor het Ulvenhoutse Bos is het vergroten en verbeteren van de vochtige bostypen (beekbegeleidende bossen en eiken-haagbeukenbossen). Daarnaast moet een inspanning worden geleverd om de drogere bostypen te behouden (beuken-eikenbossen met hulst). Uitbreiding van de oppervlakte aan vochtige bostypen is op bescheiden schaal mogelijk. Winst is vooral te behalen met de kwaliteit: het moet mogelijk zijn om de rijke ondergroei van weleer te herstellen.

4.2 Belangrijkste knelpunten

De knelpunten in het Ulvenhoutse Bos hebben een sterke samenhang met elkaar. Hieronder staan de belangrijkste knelpunten waardoor de instandhoudingsdoelstellingen van de habitattypen op dit moment niet behaald worden:

- **Verdroging** van de vochtige bossen als gevolg van een verlaagde grondwaterspiegel door versnelde afvoer van water uit het bos. Mogelijk spelen grondwateronttrekkingen in de regio een rol. Ook de aanwezigheid van naaldbos (dat jaarrond sterk water verdampt) draagt bescheiden bij aan de verdroging. Door de verdroging verdwijnen de bijzondere vochtminnende soorten, verarmt de soortensamenstelling en vermindert de kwaliteit van de vochtige alluviale bossen en eiken-haagbeukenbossen.
- **Verzuring** van de bodem wordt veroorzaakt doordat het gebufferde grondwater dieper weg is gezakt, door stikstofdepositie en door een dikke strooisellaag met slecht verterende bladeren en naalden op de bosbodem. Door deze verzuring verarmt de soortensamenstelling van de bosbodem.
- Eutrofiëring wordt eveneens veroorzaakt door verdroging, door stikstofdepositie en door de dikke strooisellaag op de bosbodem. Deze verrijking met nutriënten zorgt ook voor een verarming van de soortensamenstelling op de bosbodem
- Ongewenste structuur en samenstelling van het bos. De bossen hebben niet de gewenste open structuur sinds het hakhoutbeheer is gestopt. De vegetatie is verarmd door verdroging, door gebrek aan licht op de bosbodem, door verzuring en eutrofiëring.
- Overleving van relictpopulaties van kenmerkende soorten is niet gewaarborgd door bovenstaande knelpunten. Zonder ingrepen op korte termijn kunnen soorten die kenmerkend zijn voor de rijke flora op de bosbodem lokaal uitsterven.

Tabel 3.5. Overzicht ecologische sleutelprocessen en hun interacties (De tussen haakjes geplaatste onderdelen zijn van secundair belang).

Sleutelproces:	**Is afhankelijk van:**	**Is sturend voor:**	**Is van grote invloed op:**
Vochtvoorziening	Externe en interne waterhuishouding	Basenvoorziening; Nutriëntenniveau	H91E0_C H910_A (H9120)
Basenvoorziening	grondwaterstroom; (inundaties beekwater; opgebrachte leem)	Zuurgraad; Nutriëntenniveau	H91E0_C H9160_A H9120
Nutriëntenniveau	Vochtvoorziening; Basenvoorziening; Stikstofdepositie	Vegetatiestructuur; Lichtklimaat	H91E0_C H9160_A H9120
Lichtklimaat	Nutriëntenniveau; Vegetatiestructuur	Overlevingskansen planten en dieren	H91E0_C H9160_A H9120

Om de doelen te behalen, is het vooral nodig om het watersysteem te herstellen en om het bosbeheer aan te passen.

4.3 Kernopgaven

De kernopgaven voor het Ulvenhoutse Bos zijn:

- Herstel van de kwaliteit en vergroting van het areaal vochtige alluviale bossen en de vergroting van het areaal.
- Behoud van de vegetatiestructuur en herstel van de kwaliteit van de eikenhaagbeukenbossen.

4.3.1 Instandhoudingsdoelstellingen

De algemene doelen van Natura2000 zijn (ministerie van LNV, 2006):

- Behoud van de bijdrage van het Natura 2000-gebied aan de biologische diversiteit en aan de gunstige staat van instandhouding van natuurlijke habitattypen en soorten binnen de Europese Unie.
- Behoud van de bijdrage van het Natura 2000-gebied aan de ecologische samenhang van het Natura 2000-netwerk zowel binnen Nederland als binnen de Europese Unie.
- Behoud en waar nodig herstel van de ruimtelijke samenhang met de omgeving ten behoeve van de duurzame instandhouding van de in Nederland voorkomende natuurlijke habitattypen en soorten.

- Behoud en waar nodig herstel van de natuurlijke kenmerken en van de samenhang van de ecologische structuur en functies van het gehele gebied voor alle habitattypen en soorten waarvoor instandhoudingsdoelstellingen zijn geformuleerd.
- Behoud of herstel van gebiedsspecifieke ecologische vereisten voor de duurzame instandhouding van de habitattypen en soorten waarvoor instandhoudingsdoelstellingen zijn geformuleerd.

De specifiekere doelen, de instandhoudingsdoelstellingen, waarvoor het Ulvenhoutse Bos als Natura 2000-gebied is aangewezen staan in Tabel 2.1.

Tabel 2.1. Instandhoudingsdoelstellingen voor het Ulvenhoutse Bos (Bron: aanwijzingsbesluit)

Code	**Habitattype**	**Staat van Instandhouding landelijk**	**Instandhoudingsdoelstellingen**	
			Oppervlak	**Kwaliteit**
H91E0_C	Vochtige alluviale bossen (beekbegeleidende bossen)	-	>	>
H9160_A	Eiken-haagbeukbossen	--	>	>
H9120	Beuken-eikenbossen met hulst	-	=	=

Legenda

Oppervlakte

=	Behoud oppervlakte
>	Uitbreiding oppervlakte

Kwaliteit

=	Behoud kwaliteit
>	Verbetering kwaliteit

Staat van instandhouding landelijk

--	Zeer ongunstig
-	Matig ongunstig
+	Gunstig

Voor Beuken-eikenbos met hulst geldt een ‘behoudsdoelstelling’. Dat betekent dat er niet gestreefd hoeft te worden naar verbetering en/of uitbreiding van deze habitattypen. Wel kan er voor behoud ook een inspanning nodig zijn. Voor de andere twee habitattypen geldt de doelstelling ‘uitbreiding oppervlakte en verbetering kwaliteit’.

4.3.2 Sense of urgency en wateropgave

Vanwege de kwaliteit van de vochtige alluviale bossen is er een **‘sense of urgency’** aan toegekend. De juiste hoeveelheid water van de juiste kwaliteit is niet aanwezig. Als gevolg van veranderingen in landgebruik en veranderingen in het hydrologisch systeem heeft er een daling van het grondwater plaatsgevonden. Hierdoor komt (tijdelijk) veel zuurstof in de bodem. In de bodem komt pyriet voor (FeS2). Bij droogval van pyrietrijke kwelzones wordt door oxidatie van pyriet zwavelzuur gevormd. Momenteel wordt het zwavelzuur dat bij oxidatie ontstaat nog gebufferd door de aanwezige kalk in de bodem. Deze voorraad is echter niet oneindig. Als de voorraad kalk opgebruikt is, zal verzuring optreden, waardoor onherstelbare schade optreedt en de instandhoudingsdoelstellingen niet meer gehaald kunnen worden. Daarom is de ‘sense of urgency’ toegekend. Grote fluctuaties van het grondwater moeten snel worden verminderd en de toestroom van basenrijk water naar het bos moet vergroot worden.

4.4 Maatregelen

Tabel 6.2. Overzicht maatregelen

Maatregelen	t.b.v. habitattype			1e beheer-planperiode	2e beheer-planperiode	Lange termijn
	H919E0_C	H9160_A	H9120			
1. Opstellen bosbeheerplan						
2. Uitvoering bosbeheerplan volgens fasering		x	x			
3. Vervolgbeheer in de verjongings-vakken, 10 jaar na aanplant		x	x			
4. Opstellen vernattingsplan						
5 Aanpakken rabatten in lagere delen en verhogen peil in de waterlopen in het bos	x	x				
6. Aanpakken oeverwallen	x	x				
7. Onderzoek naar externe infiltratie-mogelijkheden en uitvoering op basis van uitkomsten onderzoek	x	x				
8. (Gedeeltelijk) verondiepen sloten langs de Huisdreef en Sint Annadreef	x	x				
9. Optimaliseren grondwaterstand d.m.v. aanpassingen in de ontwatering binnen en buiten Ulvenhoutse Bos	x	x				
10. Populatiebiologische beheermaat-regelen voor herstel relictpopulaties	x	x				
11. Kleinschalige beheermaatregelen om standplaatsen relictpopulaties te verbeteren	x	x				
12. Onderzoek oplossing parkeer-probleem Huisdreef en uitvoering		x				
13. Onderzoek naar populatie-biologische knelpunten van rest-populaties typische soorten	x	x				
14. Onderzoek externe infiltratiemogelijkheden en effecten						
~~14~~15. Onderzoek toestroom dieper basenrijk grondwater	x	x				
~~15~~16. Onderzoek naar kalkvoorraad deklaag	x	x				
~~16~~17. Opstellen monitoringsplan						
~~17~~18. Monitoren hydrologische en bosbeheermaatregelen	x	x				
~~18~~19. Monitoren verspreiding habitattypen en typische soorten	x	x				
~~19~~20. Vastleggen nulsituatie en jaarlijkse monitoring van de deelpopulaties van kwetsbare typische soorten	x	x				
~~20~~21. Uitvoeren onderzoek mogelijke verontreiniging Huisdreef. Hieruit volgende maatregelen in volgende beheerplanperiode						

Tabel 7.1. Trekker van de maatregelen.

Maatregelen	Trekker
1. Opstellen bosbeheerplan	SBB
2. Uitvoering bosbeheerplan volgens fasering	SBB
3. Vervolgbeheer in verjongingsvakken	SBB
4. Opstellen vernattingsplan	SBB
5. Aanpakken rabatten in lagere delen en verhogen peil in waterlopen in het bos	SBB
6.Aanpakken oeverwallen	SBB
7. Onderzoek naar externe infiltratiemogelijkheden en uitvoering op basis van uitkomsten onderzoek	gemeente Breda
8. (Gedeeltelijk) verondiepen sloten langs Huisdreef en Sint Annadreef	gemeente Breda
9. Optimaliseren grondwaterstand d.m.v. aanpassingen in ontwatering binnen en buiten het Ulvenhoutse Bos	Waterschap Brabantse Delta
10. Populatiebiologische beheermaatregelen voor herstel relictpopulaties	SBB / Gemeente Breda
11. Kleinschalige beheermaatregelen om standplaatsen relictpopulaties te verbeteren	SBB / Gemeente Breda
12. Onderzoek naar oplossing parkeerprobleem Huisdreef en uitvoering	gemeente Breda
13. Onderzoek naar populatiebiologische knelpunten van restpopulaties typische soorten	SBB
14. Onderzoek externe infiltratiemogelijkheden en effecten	SBB / Waterschap Brabantse Delta
~~14~~15. Onderzoek toestroom dieper basenrijk grondwater	SBB / Waterschap Brabantse Delta
~~15~~16. Onderzoek naar kalkvoorraad bodem	SBB
~~16~~17. Opstellen monitoringsplan	SBB, waterschap Brabantse Delta
~~17~~18. Monitoren hydrologische en bosbeheermaatregelen	SBB, Waterschap Brabantse Delta
~~18~~19. Monitoren verspreiding habitattypen en typische soorten	SBB
~~19~~20. Vastleggen nulsituatie en jaarlijkse monitoring deelpopulaties kwetsbare typische soorten	SBB
~~20~~21. Uitvoeren onderzoek naar mogelijke verontreiniging Huisdreef. Maatregelen die hieruit volgen zullen in volgende beheerplanperiode worden genomen.	Gemeente Breda

4.5 Eindconclusie

Met de concrete gebiedsmaatregelen uit de 1e PAS-periode en de beoogde maatregelen in de 2e en 3e periode is er geen twijfel dat de instandhoudingsdoelen op termijn kunnen worden behaald. Behoud is geborgd, dus verslechtering wordt voorkomen. 'Verbetering van de kwaliteit' of 'uitbreiding van de oppervlakte' van de habitattypen of leefgebieden kan in de gevallen waarin dit een doelstelling is in een tweede of derde tijdvak van dit programma aanvangen. Het behalen van de instandhoudingsdoelstellingen hangt mede samen met het treffen van generieke **emissiebeperkende maatregelen** en maakt de uitgifte van de ontwikkelingsruimte mogelijk.

In deze gebiedsanalyse is op basis van de best beschikbare wetenschappelijke kennis inzichtelijk gemaakt en onderbouwd dat,

- gegeven de in deze analyse geschetste depositieverloop waar binnen de te verwachten uitgifte van ontwikkelingsruimte is meegewogen en gegeven de staat van instandhouding, de trend en de afstand tot de KDW van de betrokken habitattypen en leefgebieden van soorten
- alsmede door de positieve effecten van geborgde uitvoering van herstelmaatregelen er met de uitgifte van ontwikkelruimte er in het gebied met zekerheid geen aantasting plaatsvindt van de natuurlijke kenmerken van het gebied.

Er treedt met de uitgifte van ontwikkelingsruimte bij het in deze gebiedsanalyse **geschetste depositieverloop** en bij de uitvoering van de in deze gebiedsanalyse genoemde en geborgde herstelmaatregelen op habitattypeniveau geen verslechtering op, behoud gedurende de eerste PAS periode is geborgd en daar waar uitbreidings- en of verbeterdoelen aan de orde zijn, geldt dat deze op termijn behaald kunnen worden ondanks de uitgifte van ontwikkelruimte.

5. Kampina & Oisterwijkse Vennen

Het Natura 2000-gebied Kampina & Oisterwijkse Vennen is een afwisselend halfnatuurlijk Kempens heidelandschap, met droge en vochtige heidevegetaties, akkertjes, meanderende beken, voedselarme vennen en blauwgraslanden. In de oeverzones van sommige vennen komt nog hoogveenvorming voor, in het zuiden liggen dopheidevelden. De Kampina is vooral van belang vanwege de natte heide en de fraaie overgangen naar schraallanden (Smalbroeken). Het hele gebied is van groot belang vanwege de vennen. Voor al deze natuurwaarden zijn instandhoudingsdoelstellingen geformuleerd. Rondom het gebied liggen landbouwgronden, dorpen en infrastructuur. Hier vinden activiteiten plaats die leiden tot de uitstoot van stikstof en deze beïnvloeden ook het ondiepe grondwater. **De voornaamste knelpunten zijn verdroging en vermesting door stikstofdepositie.**

De instandhoudingsdoelstellingen worden binnen het gebied gerealiseerd door **aan te sluiten bij bestaand beleid**, met name de opgave voor het Natuurnetwerk Brabant (NNB) en Natte Natuurparels waar al inrichtingsplannen voor zijn opgesteld. **Door de voorgestelde of bestaande maatregelen kunnen de instandhoudingsdoelstellingen worden behaald**. Voor het gebied Smalbroeken is specifieke aandacht nodig voor de instandhoudingsdoelstellingen voor blauwgraslanden en oude bossen. Beide moeten gerealiseerd worden in een klein gebied nabij de Beerze. Voor deze habitats zijn echter wel verschillende grondwaterregimes noodzakelijk. Het is nu nog niet duidelijk hoe dit praktisch ingevuld kan worden.

Bij de opstelling van de Natura 2000-plannen zijn belanghebbende partijen betrokken, zoals agrarische en natuurorganisaties, terreineigenaren, waterschappen en gemeenten. Deze partijen hebben de afgelopen jaren in verschillende gremia hun bijdragen geleverd aan dit beheerplan.

Gedeputeerde Staten van de provincie Noord-Brabant is verantwoordelijk voor het opstellen van het beheerplan Kampina & Oisterwijkse Vennen. Bij de opstelling van de Natura 2000plannen zijn belanghebbende partijen betrokken. Deze staan opgesomd in tabel 1. Deze partijen hebben de afgelopen jaren in verschillende gremia hun bijdrage geleverd aan dit beheerplan.

Deelnemende instanties Gebiedsteam	**Deelnemende instanties Ambtelijke adviesgroep**
• Brabants Landschap • Gemeente Boxtel • Gemeente Oirschot • Gemeente Oisterwijk • Natuurmonumenten • Provincie Noord-Brabant • Royal Haskoning • Waterschap De Dommel	• ANWB • BAJK • Brabant Water • Brabants Landschap • Brabantse Milieufederatie • DLG • Gemeente Boxtel • Gemeente Haaren • Gemeente Oirschot • Gemeente Oisterwijk • Kamer van Koophandel • Natuurmonumenten • Provincie Noord-Brabant • Sight • TOP Brabant • Waterschap De Dommel • ZLTO

5.1 Huidige activiteiten

- Natuurbeheer
  - Brabants Landschap, Natuurmonumenten, diverse projecten
- Recreatie
- Infrastructuur
- Watergebruik
- Jacht, wildbeheer en schadebestrijding

5.2 Instandhoudingsdoelstellingen

Code	Nederlandse naam	Doelstelling			Huidige staat van instandhouding en trend
		Oppervlak/ omvang	Kwaliteit (leefgebied)	Populatie / minimum-aantal	
Habitattypen					
H2310	Stuifzandheiden met struikhei	Uitbreiding	Verbetering	n.v.t.	Matig ontwikkeld onder druk door vergrassing, verbossing en betreding.
H2330	Zandverstuivingen	Uitbreiding	Verbetering	n.v.t.	Matig ontwikkeld, kleine oppervlakte. Door bosaanplant, opslag en vergrassing is een groot deel vastgelegd.
H3110	Zeer zwakgebufferde vennen	Uitbreiding	Verbetering	n.v.t.	Goed ontwikkeld, afhankelijk van aanvoer gebufferd grondwater is er potentie voor herstel.
H3130	Zwakgebufferde vennen	Uitbreiding	Verbetering	n.v.t.	Goed tot matig ontwikkeld met een positieve trend en potentie voor verder herstel.
H3160	Zure vennen	Behoud Afname ten gunste van H3130/ H7110B mag wel	Verbetering	n.v.t.	Goed tot matig ontwikkeld met een positieve trend. Nader onderzoek is nodig.
H4010A	Vochtige heiden	Uitbreiding	Verbetering	n.v.t.	Matig ontwikkeld en stabiel. Kwaliteitsverbetering aannemelijk door beheer.
H4030	Droge heiden	Uitbreiding	Verbetering	n.v.t.	Positieve trend. Deels goed ontwikkeld, deels matig. Kwaliteitsverbetering aannemelijk door beheer en maatregelen.
H6410	Blauwgraslanden	Behoud	Verbetering	n.v.t.	Niet stabiel. Klein oppervlak, bosopslag en mogelijk sprake van verzuring. Nader onderzoek nodig.
H7110B	Actieve hoogvenen	Uitbreiding	Verbetering	n.v.t.	Trend onbekend, kleine oppervlakte maar stabiel.
H7150	Pioniersvegetaties met snavelbiezen	Uitbreiding	Behoud	n.v.t.	Goed tot matig ontwikkeld met een positieve trend.
H7210	Galigaanmoerassen	Behoud	Verbetering	n.v.t.	Beperkt aanwezig, goed ontwikkeld, stabiel, maar uitbreiding mogelijk.
H9190	Oude eikenbossen	Behoud	Verbetering	n.v.t.	Klein areaal (1 perceel), kwaliteit onder druk door opslag naaldhout.
H91E0C	Vochtige alluviale bossen	Behoud	Verbetering	n.v.t.	Matig ontwikkeld maar stabiel.
Habitatsoorten					
H1082	Gestreepte waterroofkever	Uitbreiding	Verbetering	Uitbreiding	Kwetsbaar. Op basis van landelijk onderzoek (2005) in Voorste Goorven aanwezig.
H1149	Kleine modderkruiper	Behoud	Behoud	Behoud	Stabiel.
H1166	Kamsalamander	Uitbreiding	Verbetering	Uitbreiding	Stabiel. Door maatregelen verbeterde oppervlakte en kwaliteit.
H1831	Drijvende waterweegbree	Uitbreiding	Verbetering	Uitbreiding	Stabiel en matige toename.
Broedvogels					
A004	Dodaars	Behoud	Behoud	30 paar	Sterke afname, vooral op de Huisvennen en Winkelsven.
A276	Roodborsttapuit	Behoud	Behoud	35 paar	Stabiel.
Niet-broedvogels					
A039	Taigarietgans	Behoud	Behoud	100 vogels (seizoens-maximum)	Afname, overwintert laatste decenium minder in Nederland.

5.3 Maatregelen

maatregel nr	Kampina	Omschrijving maatregel	H2310 Stuifzandheiden met struikheide	H2330 Zandverstuivingen	H3110 Zeer zwakgebufferde vennen	H3130 Zwakgebufferde vennen	H3160 Zure vennen	H4010 Vochtige heiden	H4030 Droge heiden	H6410 Blauwgraslanden	H7110B Actieve hoogvenen	H7150 Pioniersvegetaties met snavelbiezen	H7210 Galigaanmoerassen	H9190 Oude eikenbossen	H91E0C Vochtige alluviale bossen	H1082 Gestreepte waterroofkever	H1149 Kleine modderkruiper	H1166 Kamsalamander	H1831 Drijvende waterweegbree	A004 Dodaars	A276 Roodborsttapuit	A039 Taigarietgans	trekker	PAS maat-regel
1	***Hele gebied***	Afschot niet-inheemse ganzen				X	X									X		X	X			X	Natuurmonumenten, Brabants Landschap	X
2	***Kampina***	Waterhuishoudkundige ingrepen in de Logt: NNP Kampina 1ste fase				X				X								X					Waterschap De Dommel	X
3	***Oisterwijkse bossen***	Onderzoek naar verplaatsen hengelsportvereniging				X												X					Natuurmonumenten	
4	***Inrichten en onderhouden NNP***	Opslag verwijderen door plaggen, begrazen, trekken	X	X	X		X	X	X	X	X	X		X							X		Natuurmonumenten, Brabants Landschap	X
5		Schonen venbodems Galgeven, Staalbergven, Voortse Goorven			X	X	X												X	X			Waterschap De Dommel	X
6		In stand houden en onderhouden aanvoer basenrijk water			X	X														X			Natuurmonumenten	X
7		Gefaseerd vrijstellen venoevers (Galgeven, Voortse Goorven en centrale vennen)			X	X	X				X								X	X			Natuurmonumenten, Brabants Landschap	X
8		Afkoppeling watertoevoer (Beeldven, Kolkvennen en Rietven): NNP Kampina 1ste fase en NNP Nemelaer			X	X	X													X			Waterschap De Dommel	
9		Verbeteren waterhuishoudkundige maatregelen t.b.v. behoud blauwgrasland (GGOR): NNP Kampina 2de fase inclusief 1,2 km Beekherstel								X													Waterschap De Dommel	X
10		Boskappen	X	X					X		X	X											Natuurmonumenten	X
11		Inrichting en beheer kleine landschapselementen (herstel gradiënten op landschapsniveau)								X													Natuurmonumenten	
12	***Onderzoek***	Verwijderen sliblaag Groot Kolkven				X	X																Waterschap De Dommel	X
13		Vooronderzoek met name hydrologie zure vennen					X																Waterschap De Dommel	X
14		Herstel Smalbroeken								X							X	X					Waterschap De Dommel	
15		Waterberging in Logtse Velden en bijbehorende waterhuishoudkundige voorzieningen in beekdal t.b.v. uitbreiding blauwgraslanden								X													Waterschap De Dommel in samenwerking met Natuurmonumenten	
16		Effect pompstation Oirschot op wegvallen regionale kwel Kempen								X									X				Provincie	
17		Effecten boskap (Gekapt bos bij Huisvennen volgen of effect voor vochtige heide! Rest volgt naar evt. vervolg)	X	X				X															Natuurmonumenten	
18	***Herstelstrategie***	Extra maaien, opslag verwijderen	X					X	X	X			X	X									Natuurmonumenten	X
19		Zeven, frezen, eggen		X																			Natuurmonumenten	X
20		Branden						X	X														Natuurmonumenten	X
21		Behouden / herstellen lokale zandbiotoop		X																			Natuurmonumenten	X
22		Aanvoer grondwater (pompvoorziening)			X																		Natuurmonumenten	X
23		Bekalken inzijggebied			X	X	X																Natuurmonumenten	X
24		Verwijderen slib (Ansemven en Glasven)					X																Waterschap De Dommel in samenwerking met Natuurmonumenten	X
25		Bekalken						X	X			X											Natuurmonumenten	X
26		Herstel lokale hydrologie			X	X	X	X				X			X								Natuurmonumenten	X

5.4 Communicatiedoelen

Om draagvlak te creëren is het belangrijk dat de diverse doelgroepen worden geïnformeerd over:

- het belang van het beheerplan;
- de wijze van handhaving en monitoring;
- de procedures die gelden voor degene die in het gebied een activiteit wil ontwikkelen;
- de mogelijkheden voor nieuwe activiteiten in en om Kampina & Oisterwijkse Vennen;
- de achtergronden van beoogde maatregelen, de afwegingen die in het beheerplan zijn gemaakt tussen de belangen van natuur en het gebruik van het gebied;
- welke handelingen wel of juist niet mogen en op welke wijze toezicht wordt gehouden;
- de geboekte resultaten.

Deze communicatie draagt bij aan de volgende subdoelen:

- betrokkenen en belanghebbenden bij de realisatie van dit beheerplan actief laten meewerken aan de positieve uitstraling van het gebied;
- het vergroten van het draagvlak onder de diverse doelgroepen;
- het creëren van een positief imago van het gebied;
- het scheppen van een realistisch beeld van de mogelijkheden, beperkingen, maar ook kansen voor mens en natuur.

De recreatiesector en de terreinbeherende organisaties spelen een belangrijke rol in de communicatie met recreanten. De provincie Noord-Brabant heeft als vergunningverlener de eerste verantwoordelijkheid voor de communicatie met burgers en bedrijven over de specifieke gevolgen van het beheerplan en de vergunningverlening op grond van de Wet natuurbescherming. De provincie heeft ook de taak om lagere overheden, gemeenten en waterschap te begeleiden in de afstemming van het beheerplan in hun beleid en wet- en regelgeving. Het ministerie van Economische Zaken heeft een rol in de algemene communicatie over Natura 2000.

Instantie	Project/deeltaak Ihkv Natura 2000	Middel	Doelgroep	Huidige en geplande communicatie-activiteiten	Wat zijn de aanvullende wensen?
Provincie Noord-Brabant	Communicatie over de provinciale beheerplannen Link tussen watercondities Natura 2000- en KRW-doelen helder voor het voetlicht brengen	Website Folders Inzet communicatieadviseur	Gebruikers & omwonenden, vergunningaanvragers	Website Folders Aansluiten bij bestaande communicatie- middelen	
Gemeente Boxtel,Oisterwijk en Oirschot		Via StreekPlatform	Bestuurders		
Waterschap De Dommel	Communicatie over projecten en activiteiten van het waterschap	Middel: website, nieuwsbrieven, infoavonden, opening en opleverings-bijeenkomsten Website Bijdragen aan activiteiten onder regie van provincie Voortgangsrapportages KRW en Waterbeheerplan	Doelgroep: gebruikers en om- en inwonenden Overheden, terreinbeheerders, belangenorganisaties, ondernemers, burgers	Nieuwsbrief, informatieavonden, Aansluiten bij bestaande communicatie-activiteiten (geen aanvullend budget)	
Brabants Landschap Natuurmonumenten	Communicatie over natuurdoelen, recreatieve mogelijkheden, ontwikkelingen en ondersteuning.	Website, excursies, infopanelen, presentaties, persberichten	Gebruikers, omwonenden, leden (maar ook brede groene achterban), instanties, belangengroepen en ondernemers		Specifieke N2000-communicatie (en -middelen) Herkenbaar, Positieve aspecten benadrukken (TOP-natuur, aanwinst omgeving, kansen, trots)
Recreatie	Communicatie over natuurdoelen, recreatieve mogelijkheden, ontwikkelingen en ondersteuning	Website, excursies, infopanelen, presentaties, persberichten	Gebruikers		
Landgoedeigenaren	Communicatie over natuurdoelen, recreatieve mogelijkheden, ontwikkelingen en ondersteuning				
ZLTO			Ondernemers in en rondom het gebied	Worden in het algemeen via Nieuwe Oogst geïnformeerd over Natura 2000 en via de website van ZLTO	Als duidelijk is welke activiteiten zijn toegestaan, welke een vergunning vereisen en welke voorwaarden er zijn, dan graag een heldere brochure/checklist

6. Strabrechtse Heide en Beuven

De Strabrechtse Heide, tussen Heeze en Someren, is het grootste aaneengesloten open heidegebied van Noord-Brabant. Van bijzondere betekenis is de nagenoeg intacte overgang van de heide naar het beekdal van de Kleine Dommel en de aanwezigheid van de laagte van de Witte Loop, die zijn oorsprong op de heide heeft. Aan de oostzijde van het gebied ligt het Beuven, het grootste heideven van Nederland, dat bekend staat om zijn waardevolle zachtwaterflora. Strabrechtse Heide en Beuven is voor het grootste deel in eigendom van Staatsbosbeheer.

Binnen Nederland is dit gebied één van de natuurparels. In Europa komt deze gradiënt van heide naar vochtige alluviale bossen met bijbehorende plant- en diersoorten niet veel voor.

6.1 Kernopgaven

Aan het gebied Strabrechtse Heide & Beuven zijn de onderstaande landelijke kernopgaven toegekend:

- 5.07 Vochtige alluviale bossen: Behoud kwaliteit en vergroting areaal vochtige alluviale bossen (beekbegeleidende bossen) *H91E0_C.
- 6.01 Zeer zwakgebufferde vennen: Herstel en duurzaam behoud van grote zeer zwakgebufferde vennen H3110 in grote open heidevelden.
- 6.05 Natte heiden: Kwaliteitsverbetering en vergroting oppervlakte vochtige heiden H4010.
- 6.08 Structuurrijke droge heiden: Vergroting areaal stuifzandheiden met struikhei H2310, droge heiden H4030 en zandverstuivingen H2330 én verbeteren van de kwaliteit door vergroting van de variatie in structuur en ontwikkeling van geleidelijke overgangen met bos.

6.2 Instandhoudingsdoelen

Het gebied Strabrechtse Heide & Beuven behoort tot het landschapstype hogere zandgronden. Binnen dit landschapstype zijn de landelijke kernopgaven en specifieke doelstellingen vertaald in zogenaamd gebied specifieke instandhoudingsdoelstellingen. Voor Strabrechtse Heide & Beuven betekent dit behoud van oppervlakte en kwaliteit van droge heide in mozaïek met stuifzandheiden met struikhei en zandverstuivingen. Binnen dit heidelandschap ligt een opgave voor uitbreiding en kwaliteitsverbetering van zeer zwak gebufferde vennen en verbetering van de kwaliteit van zwak gebufferde vennen, vochtige heiden. Voor zure vennen geldt een behoudsopgave. Vochtige alluviale bossen zijn een prioritair habitattype en worden daarom in de tekst aangegeven met een *. Prioritaire doelen zijn voor de Europese Unie van bovengemiddeld belang.

Natura 2000 kent doelen op landelijk en gebiedsniveau. Landelijk zijn er landschapstypen aangewezen. Strabrechtse Heide & Beuven behoort tot het landschapstype **hogere zandgronden**, daarnaast is ook het landschapstype **beekdalen** relevant.
De landschappelijke opgave voor de hogere zandgronden wordt als volgt omschreven: “Vergroten van interne samenhang van gebieden door herstel van evenwichtige verdeling van open en gesloten met meer geleidelijke overgangen van zandverstuivingen, heide, vennen, graslanden en bos. Versterken van het ruimtelijk netwerk van bos, heide- of stuifzandgebieden, waarbij tussenliggende gebieden gebruikt kunnen worden als stapstenen, in het bijzonder voor soorten als reptielen en vlinders. Versterken van overgangen van droge naar natte gebieden, zoals beekdalen en herstel van vennen op landschapsschaal.”
De opgave voor de beekdalen is: “Versterken van de functionele samenhang van de Natura 2000-gebieden met hun omgeving ten behoeve van duurzame instandhouding en ter vergroting van de algemene biodiversiteit. Onder andere door herstel natuurlijke waterstromen en –standen, zowel grondwater als oppervlaktewater van goede kwaliteit, en op termijn herstel van overstromingsdynamiek. Binnen de Natura 2000-gebieden herstel van gradiënten en mozaïeken van verschillende onderdelen, met name ten behoeve van kalkmoerassen, blauwgraslanden en vochtige alluviale bossen.” (Ministerie van LNV, 2006a).

Tabel 2.1. Instandhoudingsdoelstellingen voor Strabrechtse Heide & Beuven.

Code	**Habitattype**	**Staat van instandhouding landelijk**	**Instandhoudings-doelstellingen**		
			Oppervlakte	Kwaliteit	
H2310	Stuifzandheiden met struikhei	--	=	=	
H2330	Zandverstuivingen	--	=	=	
H3110	Zeer zwakgebufferde vennen	--	>	>	
H3130	Zwakgebufferde vennen	-	=	>	
H3160	Zure vennen	-	=	=	
H4010A	Vochtige heiden (hogere zandgronden)	-	=	>	
H4030	Droge heiden	--	=	=	
H91E0_C*	Vochtige alluviale bossen (beekbegeleidende bossen)	-	=	>	
	Soorten		**Oppervlakte biotoop**	**Kwaliteit biotoop**	**Draagkracht (omvang populatie)**
H1831	Drijvende waterweegbree	-	=	=	=
	Broedvogels		**Oppervlakte leefgebied**	**Kwaliteit leefgebied**	**Draagkracht (aantal paren)**
A021	Roerdomp	--	=	=	5
A022	Woudaap	--	=	=	2
	Niet-broedvogels				Draagkracht
A127	Kraanvogel	--	=	=	n.v.t.

Legenda

Oppervlakte	
=	Behoud oppervlakte
>	Uitbreiding oppervlakte
= (<)	Enige achteruitgang ten gunste van actieve hoogvenen is toegestaan
Kwaliteit	
=	Behoud kwaliteit
>	Verbetering kwaliteit
Staat van instandhouding landelijk	
--	Zeer ongunstig
-	Matig ongunstig
+	Gunstig

Sense of urgency en wateropgave
Voor de kernopgaven 'vochtige alluviale bossen, 'zeer zwakgebufferde vennen' en 'natte heiden' bestaat een wateropgave. Een wateropgave (W) is toebedeeld aan een habitattype als de watercondities in meer of mindere mate niet op orde zijn, maar dat wel noodzakelijk is voor het bereiken van de doelen. Er is geen sense of urgency.

Huidig gebruik
Niet alleen de standplaats is belangrijk voor de te beschermen Habitats, ook het gebruik van het gebied en de omgeving kan invloed hebben op het behalen van de doelen. De belangrijkste vormen van gebruik in Strabrechtse Heide & Beuven zijn **recreatie en beheer** door onder anderen Staatsbosbeheer en Brabants Landschap. **Daarbuiten** hebben vooral **activiteiten die invloed hebben op de grondwaterstand, de waterkwaliteit** van de Kleine Dommel en de voedselrijkdom in het gebied een relatie met het bereiken van de doelen.

6.3 Knelpunten

Tabel 3.9. Overzicht knelpunten en de Natura 2000–doelen.

		Habitattypen								Soorten			
Knelpunt	**Oorzaak**	H2330	H2310	H4030	H4010_A	H3110	H3130	H3160	H91E0-C	H1831	A021	A022	A127
Verdroging - kwantiteit	- Daling lokale grondwaterstand - Daling regionale grondwaterstand				X	X	X	X	X	X			
Verdroging - kwaliteit (gebrek aan basen via kwel)	- Daling lokale grondwaterstand - Daling regionale grondwaterstand					X	X		X	X			
Onnatuurlijk venpeil – te weinig dynamiek	- Ingrepen rond Peelrijt en Beuven					X				X	X	X	
Eutrofiëring	- Door stikstofdepositie - Via grondwater - Via oppervlaktewater - Andere bronnen (uitwerpselen, blad)	X	X	X	X	X	X	X	X	X	X	X	
Te weinig winddynamiek	- Te klein areaal - Aanwezigheid van bossen	X	X			X	X	X					

gebleken dat de huidige knelpunten veroorzaakt worden door problemen in een aantal sleutelprocessen.

Tabel 6.1. Overzicht van de voornaamste knelpunten per landschapstype.

	Verdroging en verzuring	**Eutrofiëring**	**Onnatuurlijk venpeil**	**Te weinig dynamiek**
I. Stuifzanden				
II. Structuurrijke heiden				
IV. Natte bossen				

6.4 Maatregelen

Om de geplande instandhoudingsdoelstellingen (uitbreiding en/of behoud van oppervlakte en/of kwaliteit) per habitattype te realiseren moet ingegrepen worden in de verschillende randvoorwaarden. Deze ingrepen (maatregelen) zijn met name gericht op het verbeteren van de situatie ten aanzien van **voedingsstoffen en hydrologie**.

Voor het Natura 2000-gebied Strabrechtse Heide & Beuven is op basis van hierboven beschreven inzichten in op te lossen knelpunten in relatie tot de te behalen instandhoudingsdoelstellingen een maatregelenpakket samengesteld. Dit pakket bestaat uit op elkaar af te stemmen maatregelen op het gebied van **hydrologie** (tegengaan verdroging en natuurlijke peilbeheer van het Beuven), **vermindering van de eutrofiëring** (verlaging van het nutriëntenniveau) en vergroten **winddynamiek** (vergroten openheid van het heidelandschap). Om de hydrologische situatie te herstellen zijn zowel binnen (intern) als buiten (extern) de begrenzing van het gebied maatregelen nodig. Maar ook om de eutrofiëring te verminderen komen externe maatregelen in beeld.

Tabel 7.1. Maatregelen, trekkende instanties, budget en fasering.

nr	Omschrijving	Maatregelen t.b.v. habitattypen								Maatregelen t.b.v. habitatsoorten				Trekker	Budget	Fasering	
		Stuifzandheide met struikheide H2310	Zandverstuivingen H2330	Zeer zwakgebufferde vennen H3110	Zwakgebufferde vennen H3130	Zure vennen H3160	Vochtige heiden H4010A	Droge heiden H4030	Vochtige alluviale bosenH91E0_C	Drijvende waterweegbree H1831	Roerdomp A021	Woudaap A022	Kraanvogel A127			BP1	BP2
1	Omvormen bos ten behoeve van vergroting inzijging regenwater													Gemeente Someren	GGOR in BP1		*
2	Dempen of verondiepen lokale ontwaterings-middelen (sloten en greppels) op de hogere delen (dekzandplateau)													Gemeente Someren, Brabants Landschap	GGOR in BP1		
3	Aanpak Witte Loop: verondiepen bodem Witte Loop en beperken drainage													Waterschap De Dommel	GGOR		
4	Opheffen van de drainerende werking van 's Heerenven													Provincie Noord-Brabant	Aanvul-lend		
5	Bekalken vennen - zo nodig													Staatsbosbeheer, Brabants Land-schap, Gemeente Someren	PAS		
6	Verondiepen lokale ontwateringsmiddelen (sloten en greppels) in beekdal Kleine Dommel													Staatsbosbeheer	PAS		
7	Peilverhoging Kleine Dommel													Waterschap De Dommel	PAS		
8	Aanpassen peilbeheer Beuven door stuwwerk/sluisbeheer													Waterschap De Dommel	GGOR		
9	Water uit Witte Loop door Marijkeven leiden													Waterschap De Dommel	GGOR		
10	Ophogen kade tussen Beuven-noord en het kanaal van Peelrijt naar Witte Loop													Waterschap De Dommel	GGOR		
11	Ontwikkelen oeverzones Beuven-noord													Waterschap De Dommel, Gemeente Someren	Deels GGOR		
12	Effectbestrijding stikstofdepositie door afvoer voedingstoffen door aanvullende reguliere beheermaat-regelen													Staatsbosbeheer, Brabants Land-schap, Gemeente Someren	PAS		
13	Uitmijnen voormalige landbouwgronden in landbouwenclave op Braakhuizer Heide													Provincie Noord-Brabant, Brabants Land-schap, particulier eigenaar	Aanvul-lend		
14	Verkennen mogelijkheden ten behoeve van verlagen mestgift in landbouwenclave													Provincie Noord-Brabant	Aanvul-lend		
15	Lokaal baggeren Witte Loop													Waterschap De Dommel	GGOR		
16	Herstel Beuven													Provincie Noord-Brabant	PAS		
17	Onderzoek maatregelen t.b.v. verbetering waterkwaliteit Kleine Dommel													Waterschap De Dommel in overleg met Staatsbosbeheer	Aanvul-lend		

18	Ontwerpen en vervolgens uitvoeren van een maatregel-pakket om runderen uit vennen te houden													Staatsbosbeheer	Aanvul-lend						
19	Verwijderen meeuwenkolonie door populatiebeheer/maat-regelen													Gemeente Someren	PAS						
20	Verwijderen leefgebied meeuwenkolonie icm opruimen effecten eutrofiëring													Gemeente Someren	Aanvul-lend						
21	Baggeren Platvoetje -zo nodig													Terrein-eigenaar	Aanvul-lend						
22	Kappen bos en verwijderen strooisellaag													Staatsbosbeheer, Brabants Landschap, Gemeente Someren	PAS						

Bestaande monitoring																					
Structuur (SBB, BL, Bosgroep, 1 x per 6 jaar)	X	X	X	X	X	X	X	X													
Basisvegetatiekartering (SBB, BL, Bosgroep, 1 x per 12 jaar)	X	X	X	X	X	X	X	X													
Doelsoortenkartering (SBB, BL, Bosgroep, 1 x per 6 jaar)	X	X	X	X	X	X	X	X													
Broedvogelkartering (SBB, BL, Bosgroep, 1 x per 6 jaar)	X	X	X	X				X		X	X										
Typische soorten (SBB, BL, Bosgroep, 1 x per 6 jaar)	X	X	X	X	X	X	X	X													
Waterkwantiteit grond- en oppervlakte-water (Waterschap, permanent)				X	X	X	X	X													
Waterkwaliteit oppervlaktewater (Waterschap, 1 x per maand)					X																
Broedvogels (Bosgroep, 1 x per jaar)																					
Kraanvogel (SBB, 1 x per jaar)																					
Drijvende waterweegbree (Bosgroep, 1 x per 10 jaar)																					
Aanvullende monitoring																					
Uitbreiding oppervlakte structuur, vegetatiekartering, broedvogels, typische soorten (SBB BL, Bosgroep, 1 x per 6/ 12 jaar)	X	X	X	X	X	X	X	X													
Waterkwantiteit grond- en oppervlakte-water (Waterschap, permanent)				X	X	X	X	X													
Waterkwaliteit grondwater (Waterschap, 1 x per maand)				X		X		X													
Drijvende waterweegbree (Bosgroep, 1 x per 6 jaar)									X												
Aanvullende onderzoeken																					
1. Onderzoek om specifieke relaties (bijv. tussen venpeil en gr.w.peil) in vennen te kwantificeren;					X	X	X														
2. Onderzoek naar effectiviteit van maatregelen	X	X	X	X	X	X	X	X													
3 Onderzoek naar vlakdekkende kwaliteit van habitattypen	X	X	X	X	X	X	X	X	X												
4. Onderzoek naar (effecten van) chemische samenstelling van dieper grondwater dat opkwelt in beekdalen								X													
5. Onderzoek naar relatie tussen specifieke milieucondities en voorkomens van biesvaren en waterlobelia in Beuven					X																
6. Onderzoek naar mogelijkheden om Peelrijtwater –probleemloos- via Aa te kunnen afvoeren				X	X	X	X														
7. Onderzoek naar mogelijke aanwezigheid van externe drainerende invloeden (en bepalen effecten daarvan)				X	X	X	X														
Doelen en resultaat																					
Doelen in aanwijzings-besluit	Doel oppervlak	=	=	=	=	>	=	=	=	=											
	Doel kwaliteit	=	=	=	>	>	>	=	>	=											
	Doel aantal paren										5	2	=								
Huidige oppervlakte (ha) en kwaliteit in het gebied	Huidig oppervlak (ha) en aantal soorten	15	31	517	175	49	16	60	15		3 - 6	0 – 3	0 – 848								
	Huidige kwaliteit *	gu	gu	gu	gu	gu	ma	onb	ma - gu	ma - gu	gu	ma	gu								
	Huidige trend (+ positief, - negatief, 0 stabiel)	+	+	+	+	-	0	0	-	?	0	0	0								
Verwachte oppervlakte (ha) en kwaliteit na 6 jaar (met maatregelen)	Oppervlakte totaal (ha)	15	31	517	175	49	16	60	15												
	Kwaliteit *	gu	gu	gu	gu	gu	gu	ma - gu	ma - gu	ma - gu											
Doel op lange termijn	Oppervlakte totaal (ha)	36	72	899	330	62	35	60	15												
	Kwaliteit *	gu	gu	gu	gu	gu	gu	gu	gu												

* gu=gunstig, ma=matig, on=ongunstig, onb=onbekend

Appendix B: Interview transcriptions *[removed for privacy regulation]*

Interviewees for the research

Organization	Role	Page
Province North Brabant	Project manager Natura 2000 Strategical advisor area development	1 5
Water board De Dommel	Policy advisor biodiversity Project manager Natura 2000 Ecologist Spatial planning advisor	9 12 15 18
ZLTO (farmers interest group for the southern part of the Netherlands)	Policy advisor	21
Natuurmonumenten (nature association)	Ecologist	23
Working group de Peel (nature activist group for Natura 2000 areas in the Peel area)	Nature activist	26
Engineering bureau Royal Haskoning DHV	Ecologist	28